FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

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Aug. 6 .... **Air League Challenge Cup**
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Oct. 7-28 .... **International Aircraft Exhibition, Berlin.**
1929
Oct. 31 .... **Guggenheim Safe-Aircraft Competition Closes.**

EDITORIAL COMMENT

BENEFITING from the lesson of last year, when the handicap formula used for estimating the racing speeds of machines proved to rule out nearly all the fast types, we understand that the subject of this year's formula is now being discussed by the authorities concerned, and that the formula suggested is, with very minor alterations, that designed by Mr. C. C. Walker, and described by him in the September 22, 1927, issue of the AIRCRAFT ENGINEER (Technical Supplement to FLIGHT). The value of the constant "K" and the biplane span allowance have been slightly modified, but the change is so small that for all practical purposes the suggested formula is Mr. Walker's original one.

Formula Racing

It may be recollected that Mr. Walker chose span rather than area (*i.e.*, "span power" rather than "wing power") as his basis mainly because, as he put it, "span is the dimension for which there is no substitute." In other words, so long as formula racing is used there will be efforts to "cheat" the formula (we use the expression, of course, without any intention of inferring any dishonourable action, and merely as it is used in yacht racing, to imply "beating" the formula), and it is therefore essential that the formula chosen should be such that in trying to "cheat" it the qualities developed by the "cheating" should be desirable ones. Mr. Walker claimed, it may be remembered, that if wing area were used, the tendency would probably be to increase chord so as to get a low figure for "wing power" (horse-power per square foot) without thereby sacrificing very much actual speed, thus obtaining a lower handicap speed. Now, adding chord can be done as a piece of "faking," and does not entail any great structural alterations ; but an increase in chord is not particularly desirable. Mr. Walker chose span because, as he said, "increase of chord is no cure for an overloaded machine, but increase of span *is*." In other words, span is a desirable feature in any machine, although it is not, perhaps, very important in a pure racing craft. But, coming back to the formula, if a formula tends to produce some "freakish" feature,

it is better that it should produce freakish spans than freakish chords. That, if we have understood him correctly, was Mr. Walker's general argument.

As regards the formula itself the changes suggested are very minor ones, and tend towards lowering the handicap speeds estimated according to the formula. The value of the coefficient " K " has been slightly reduced and the biplane allowance altered so as to give a greater value of span^2.

In view of what happened last year, it is of the greatest importance that the subject of a handicap formula should be thoroughly ventilated, and we have taken up the matter this week so as to call attention to the fact that the subject is now under review. Last year nobody discovered the " snag " until it was too late (although the formula had been given in FLIGHT months previously). It would be a pity to have the same thing happening again.

Examining the curve given by Mr. Walker in the article to which we have referred, it is found that at the lower speeds, *i.e.*, for small values of b.h.p./span^2, the formula is in fairly good agreement with actual examples of machines. At higher values of this ratio, however, the formula tends to over-estimate speed by a considerable amount. This rather seems to suggest that a possible remedy might be to make " K " vary with " span power " in such a manner that as horse-power per foot of span increases so does the value of " K " decrease. Merely changing the value of " K " and keeping it constant for the whole range of types would not effect a cure. Whatever one does, no formula can ever accurately " fit " all machines, since some are bound to be more efficient than others. Mr. Walker's plea for a formula which compels us to " aim high " is perfectly sound, and certainly the formula chosen should tend to " improve the breed." But it should be remembered that formula racing, unless the prizes to be won are very substantial, is not likely to induce firms to build special machines. Moreover, the greater the power of a machine the higher its cost, so that a formula which rules out existing high-power machines is likely to have the effect of confining formula racing to the low-power type. We do not for one moment suggest that the small machines should be ruled out. On the contrary, the suggested formula seems to " fit " these machines reasonably well, and it is for that reason that we suggest retaining the present value of " K " for them. But, in order to ensure the entry of high-power machines, it would, we submit, be wise to make sure that this year's formula does not handicap them right out of the race. Certainly, if the value of " K " be adjusted, as we have suggested, on a " sliding scale," it will be found possible to build a high-power machine which will beat the formula. But then, if a firm is willing to go to the expense of constructing a special machine of this type for the King's Cup Race, is it not entitled to a good chance in the race? We personally think the answer to that must be Yes. Mr. Walker determined the value of 261·3 for " K " from the Curtiss racer R3.C_1. Therefore, it is obviously possible to design a high-power machine which will attain the speed calculated by the Walker formula. But the point is, it seems to us, that no such machine is in the least likely to be built for the race, and that, therefore, it would be better to concede a point to existing British high-power machines. In point of fact, we know of at least one British single-seater fighter which the suggested formula exactly fits. Thus, if the value of " K " be progressively lowered as the " span power " increases, this machine would be able to " cheat " the formula. But that machine is a particularly efficient one, and personally we consider that such a machine deserves to be encouraged.

While we do not suggest that the Walker formula is the only one possible, we do think it forms an excellent basis for discussion, and we would welcome the views of readers on the subject. To us it seems important that the matter should be thoroughly thrashed out, not merely in the drawing offices of the firms, but by a much wider circle. Last year what happened was that firms examined the formula to see how their own machines fared under the formula. Finding that speeds were under-estimated, they agreed to the formula, without bothering to see how other firms' machines would be affected. The result we all remember. A repetition of this occurrence would be most regrettable.

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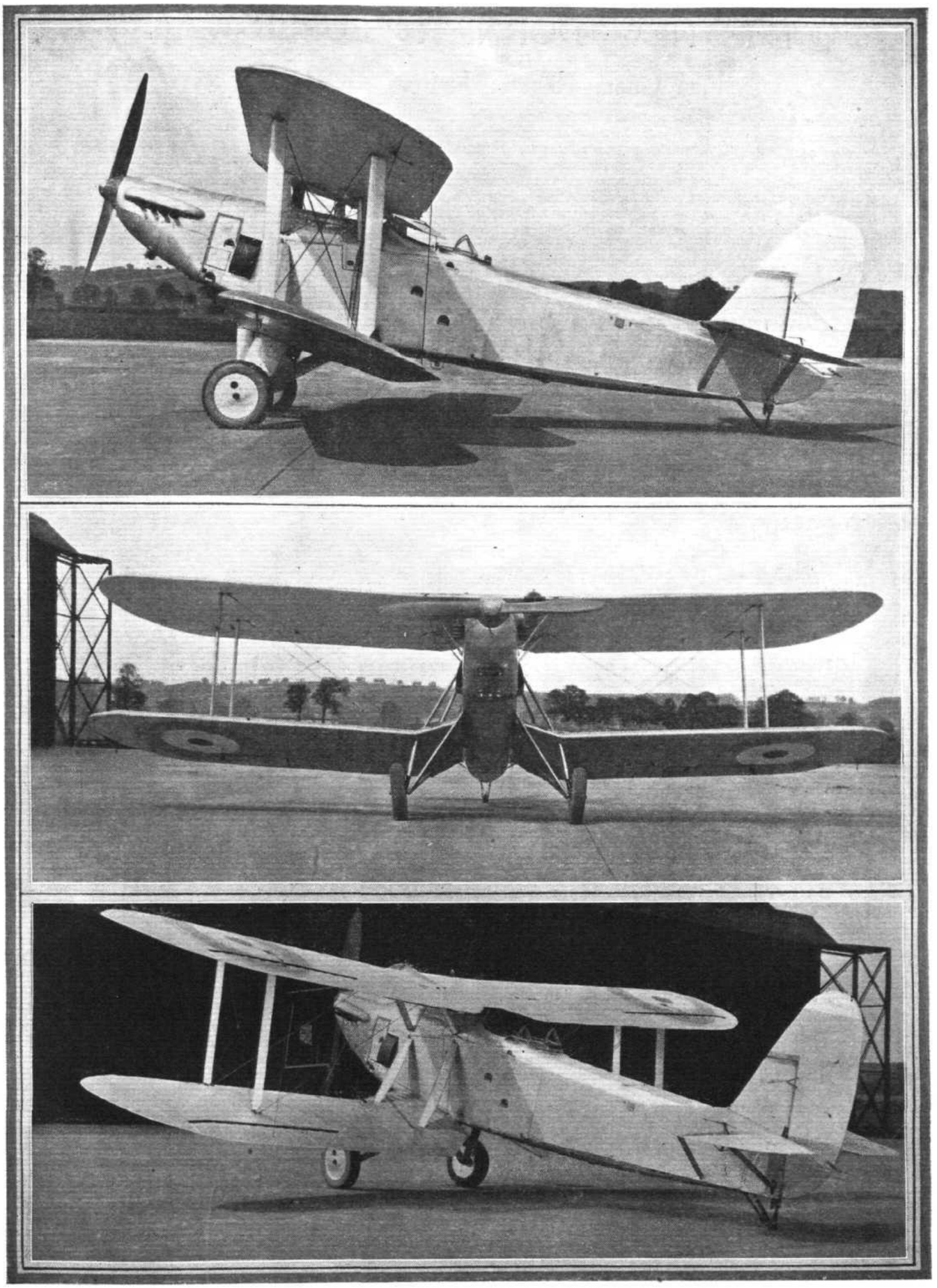
Hard Luck

Within the last couple of days ill-luck has attended two great British flights: Mr. Lancaster's Avro " Avian," on which he was flying to Australia with a passenger, has come to grief at Muntok—unfortunately, causing slight injuries to Mr. Lancaster and to Mrs. Miller, his passenger; and Sir Alan Cobham's Short " Singapore," just repaired after a previous accident caused by a gale while moored, has broken away from her moorings and drifted on to the rocks, sustaining some damage, the exact extent and nature of which is not yet known. To both crews we extend our sincere sympathy in their misfortunes.

The " Avian " had put up a splendid flight of greater distance than any hitherto made with a machine of such low power, and, moreover, it was carrying a passenger, so that, what with the extra weight, a large quantity of fuel, luggage, etc., it must have been very heavily loaded. In spite of this it had been making good progress, and to have got as far as it did is a very fine performance. It is to be hoped that the two plucky travellers may be able to continue on another machine, if this one should prove to be damaged beyond repair.

Sir Alan Cobham's usual lucky star seems for the moment to have deserted him. His mishaps have both occurred while the " Singapore " was moored, and appear to have been due entirely to quite exceptional weather conditions. We take it for granted, of course, that the crew possess that " marine airmanship " of which Sqdn.-Ldr. Maycock spoke at the R.Ae.S., I.Ae.E., and that everything had been done which could be done to ensure the safety of the machine at her moorings. We have no personal knowledge of conditions at Malta, but it seems evident that the anchorage must have been a fairly exposed one for the boat to have broken away as it did, and it is most unfortunate that the bad weather should have occurred just when it did; otherwise Sir Alan and his party would by now have been well on their journey down through Africa. We hope it will be found, when a careful examination has been made, that the machine has not sustained serious damage, and that it may be possible soon to continue the flight under more fortunate conditions.



THE LATEST TYPE OF TORPEDO-PLANE : Three views of the Blackburn "Ripon II," fitted with Napier "Lion" engine. The Blackburn Co. has specialised on the production of torpedo-planes for many years, and the present type marks a very distinct advance. The machine can also be fitted with floats and operate as a seaplane.

THE NEW DORNIER "SUPER-WAL"

Four Gnome-Rhone "Jupiter" Geared Engines

SEVERAL weeks ago we recorded in FLIGHT the completion at Friedrichshafen of a new Dornier "Super-Wal" intended for passenger-carrying. The machine has now passed its preliminary flight tests, and although maintaining a seemly reticence concerning weights and performance, the Dornier Metallbauten Gesellschaft of Friedrichshafen have sent us two photographs of this machine, and a certain amount of information. The new "Super-Wal" is claimed to have attained a top speed of 220 km/hr. (136·5 m.p.h.), while the photograph of the machine on the water is stated to represent the "Super-Wal" taking off with a total loaded weight of 15 tons (metric, presumably). It is not clear whether the top speed claimed was attained with the full total loaded weight of 15 tons (33,000 lbs.) or at some lower total weight, but assuming the former to be the case, the Everling "High-speed Figure" is 14·2, which does not appear unduly high for a "Wing Power" of 13·4 h.p/sq.m. (1·25 h.p./sq. ft.). On the other hand, if we examine the Everling "Distance Figure" (which is, of course, the propeller efficiency multiplied by L/D at top speed), this is found to be 6·4, which is an unusually high value. Thus if it is assumed that the propeller efficiency, with the geared engines used, is 0·75, the L/D corresponding to top speed is 8·53. It would appear somewhat doubtful whether this is likely to be attained. Even if we increase the propeller efficiency to 0·80, the L/D is still as high as 8. The machine is probably very "clean" in the aerodynamic sense, what with the small amount of wing bracing and the engines placed in tandem, but even so, the "Distance Figure" is so high as to make one a little suspicious. If the above value of the "Distance Figure" is indeed correct, the "Super-Wal" would seem to be an excellent machine for long-distance flights, provided the structure weight is not unduly high.

Constructionally the new "Super-Wal" is of normal Dornier type, with a boat hull of Duralumin and a monoplane wing with steel spars and Duralumin ribs and covering. Lateral stability on the water is obtained as in previous Dornier boats by wing stumps growing out of the hull.

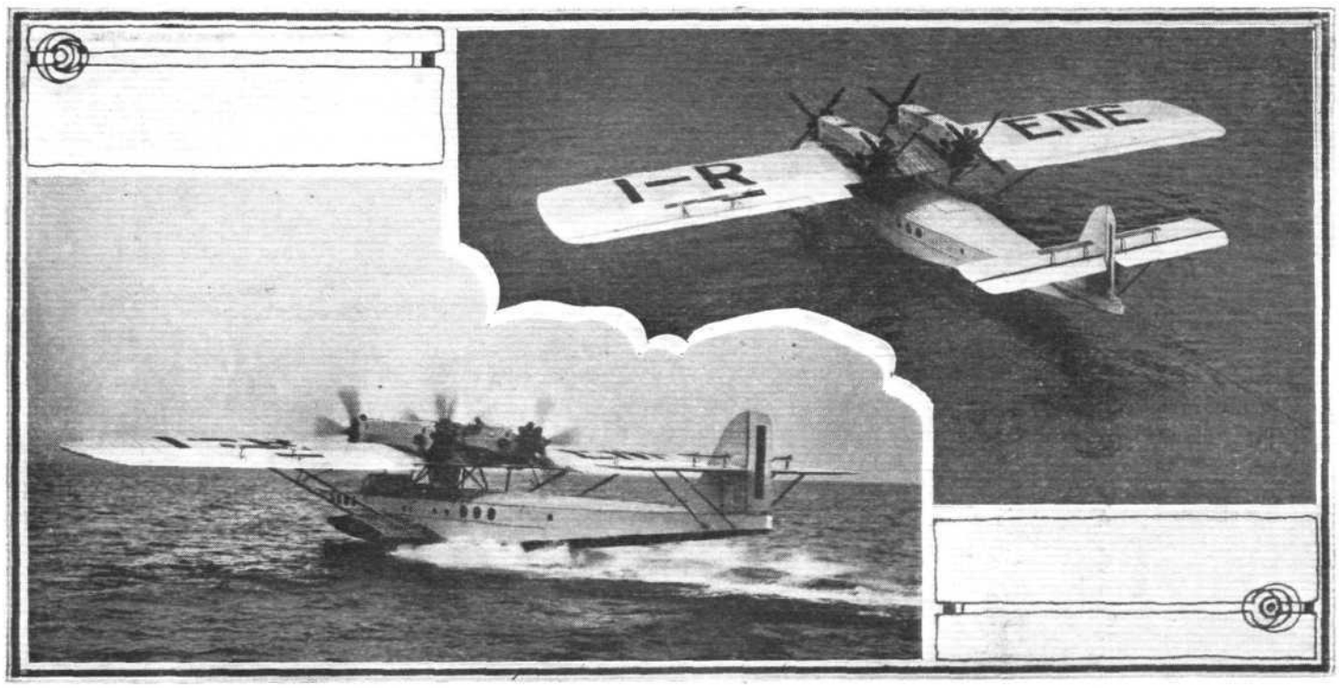
The boat hull is divided into a series of compartments, in the following order, starting from the bows: space for navigating gear; cabin for 12 passengers; pilots' cockpit on the port side (dual controls), wireless compartment on starboard side; fuel and luggage space; and finally aft cabin with room for 8 passengers.

The fuel compartment contains 8 petrol tanks, 4 of 300 litres (66 gallons) each, and 4 of 600 litres (132 gallons) each, giving a total petrol capacity of 3,600 litres (792 gallons). With the petrol in the hull and the engines on top of the wing, pressure feed must necessarily be employed, a system not now in favour in this country, and with four engines to feed from eight different tanks, it may be assumed that the petrol system is far from being simple.

The photographs show quite clearly the arrangement of the four 480 h.p. Gnome-Rhone "Jupiter" engines, which are placed in two tandem pairs some distance out on the wing. The engines are fitted with the Farman type of reduction gear, so that the wooden propellers are running at one-half engine speed. The efficiency should, therefore be good, especially for taking off, but no data are available concerning the length of run required.

No information is available concerning the weight empty etc., of the "Super-Wal" but following are the main dimensions:—

Length of machine overall	24·6 m. (80 ft. 8 in.)
Height	5·9 m. (19 ft. 4 in.).
Wing span	28·6 m. (93 ft. 9 in.).
Wing area	143 sq. m. (1,540 sq. ft.)



A MERE BAGATELLE: Two views of the new Dornier "Super-Wal" flying-boat, which is fitted with four "Jupiter" engines. It has a wing span of 93 ft. 10 in., and a wing area of 1,539 sq. ft. Note the tandem arrangement of the wings.

Mr. Bert Hinkler's Plans

THE long contemplated flight of Mr. Bert Hinkler's from London to Australia is to commence shortly. He was forced to postpone his plans last year owing to other demands made upon his services which included, for instance, testing the "Crusader" racing seaplane, etc. He will use his own Avro "Avian," which has had the fuel capacity increased to allow for a series of 1,000-mile stages. At this rate of travel Mr. Hinkler should reach Australia in a fortnight.

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THE NEW KOOLHOVEN LIGHT 'PLANE

The F.K. 30 "Toerist" With Siemens Engine

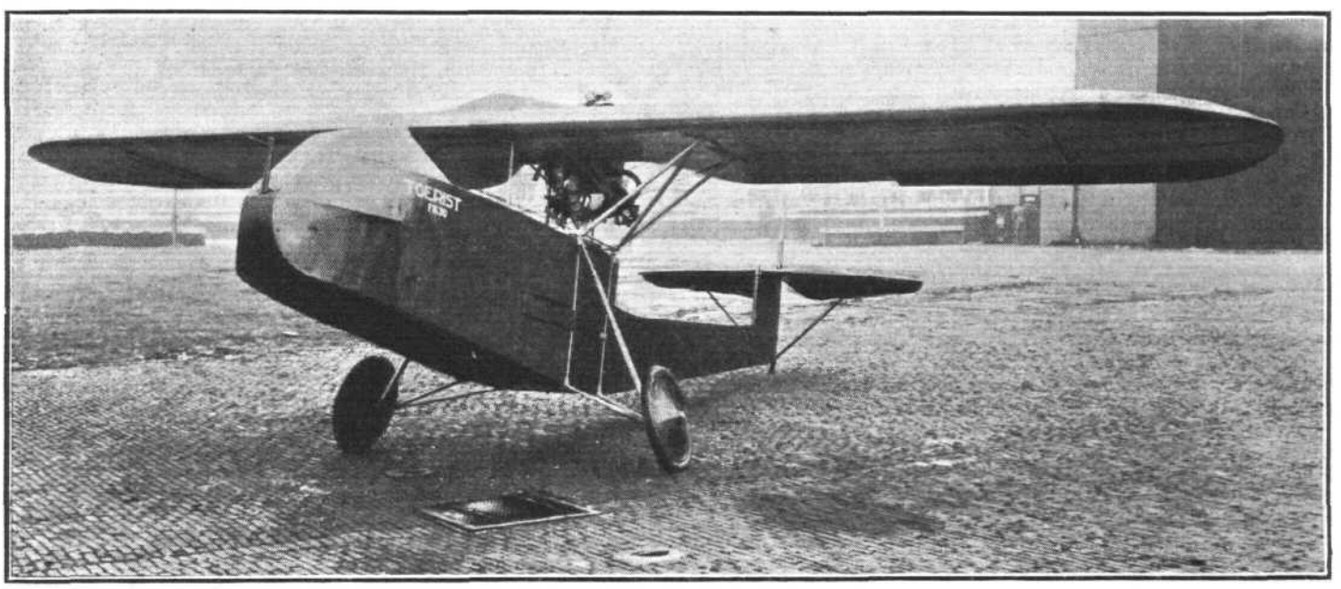
IN our issue of February 3, 1927, we published general arrangement drawings and a description of a new light monoplane designed by Mr. Frederick Koolhoven of Rijswijk, Holland. At the time, the machine had just been designed, and the work of construction had not been commenced. The machine has now been completed and has, we understand, been put through some of its flying tests. It may be recollected that one of these machines was ordered by Mr. Clifford Harmon, President of the International League of Aviators, who intends to use it for visiting the various European posts of the League.

The F.K. 30 is of very unusual design, and may be said to represent an attempt to combine the comfort and view of the old pre-war "pusher" type of machine with the aerodynamic efficiency of modern aircraft. Whether or not Mr. Koolhoven has succeeded in this aim cannot be said until complete test results are available, and some practical experience has shown how the machine behaves in regular use. That there will be minor "teething troubles" to get through is to be expected in a type which differs so materially from the normal.

A comparison between the photograph published this week, which has just been received, and the general arrangement drawings published in our February 3 issue, it will be observed that certain minor changes have been made since the original lay-out of the machine. These, however, are not of a nature to cause any fundamental changes in the design, which remains a parasol "pusher" semi-cantilever monoplane. Apart from the "pusher" arrangement, the Koolhoven F.K. 30 is remarkable on account of the "turntable" mounting of the wing and engine unit. This turntable, secured to the fuselage structure just below the engine, supports the whole superstructure. Normally, the turntable is locked in position with the wing "spread," but by undoing a quick-release the turntable can be rotated, bringing the wing into a fore-and-aft or "folded" position, the engine taking part in this rotation. With the wing "folded," the engine is outboard, and thus throws a load on that side of the undercarriage, but as the wheel track is wide, there is probably little or no tendency for the machine to tilt over. From the photograph it will be noted that the wheels are somewhat "knock-kneed." At the moment it is not quite clear whether this is due to the shock absorbers not having been in place when the photograph was taken, or to too weak rubbers. At any rate, this position probably represents maximum travel, which in this machine is very large, something like one foot, as against the three or four inches more usually found on small machines.

The fuselage and wing are both covered with three-ply, so that there should be no question of rigging or keeping in trim the machine during use. In the deep portion of the fuselage, under the engine mounting, is a large luggage compartment. The two seats are arranged in tandem, and dual controls are provided. The view is particularly good forward and down as there is neither engine nor wing in front to obstruct it.

The high centre of thrust resulting from this unusual arrangement of the machine may be expected to have an effect on the trim according to whether the engine is running or not, but the same applies in large flying-boats, where the forces are much greater, and with proper design there is no reason to believe that this should give rise to any trouble. The slight loss in efficiency due to the down load on the tail probably does not amount to a great deal either, and if the advantages of the "pusher" can be attained without much sacrifice in performance or trim, they would be well worth having. The narrow and shallow rear portion of the fuselage is open to objection on the score that it will require to be comparatively substantially built so as to give the strength necessary to carry a tail mounted high above it, and in the slipstream of, and fairly close to, the propeller. This feature, however, is Mr. Koolhoven's modern manner of getting away from the open tail girders of the old "pushers." To keep the machine small and compact, Mr. Koolhoven has had to use a fairly heavy wing loading, although a wing section of fairly deep camber helps to keep down the landing speed, which is claimed to be only about 40 m.p.h.



THE NEW KOOLHOVEN MONOPLANE: Three-quarter front view of the F.K. 30 "pusher" with Siemens engine.

There is no fuel in the fuselage, the petrol being contained in two tanks in the wing, one on each side some little distance out. As the engine is entirely exposed, there should be little or no risk of fire, especially as the pipes from the tank have been so arranged as to reduce to a minimum the consequences of a fractured pipe.

The Koolhoven F.K. 30 shown in the photograph is fitted with a Siemens engine, but we gather that if desired it can be supplied with a "Genet" or other similar engine of approximately the same power.

The F.K. 30 weighs 330 kgs. (726 lbs.) empty, and carries a useful load of 300 kgs. (660 lbs.), giving a total loaded weight of 630 kgs. (1,386 lbs.). The useful load can be composed of pilot, passenger, 90 lbs. of luggage, and five hours' fuel, or, of course, any other combination giving the same total, such as more luggage and less fuel, and so forth. The packing case for the machine is constructed to be used as hangar and workshop.

EMPIRE AIRSHIP MISSION'S RETURN

THE Airship Mission has just returned to England after touring Africa, Australia, New Zealand and India. It consisted of Group-Capt. P. F. M. Fellowes (Director of Airship Development), Mr. M. A. Giblett (Superintendent, Airships Meteorological Division), and Flt.-Lieut. S. Nixon, of the Royal Airship Works. It is expected that the first demonstration flights to the Dominions of the new British airships will be made at the end of 1929 or early in 1930.

The results of this Mission, we learn, are very satisfactory, for not only has considerable spade work in connection with the proposed Empire Airship Routes been accomplished, but throughout the Dominions the Mission found great interest displayed in the proposals, especially among business and commercial concerns. The possibilities of the airship, in providing quicker communication with the Mother Country, were in nearly every case fully appreciated.

At every centre visited, also, the Mission was well received, and given every possible assistance in its work. The Mission has placed before each Dominion a full statement regarding the main requirements for the operation of the routes.

A choice of sites for airship bases has been drawn up in India and Ceylon, Australia, New Zealand, Tasmania, and South Africa, while certain intermediate bases have been considered in the Cocos Islands and on the east and west coasts of Africa.

As a result of a survey of these bases, a provisional skeleton of the chief commercial airship routes has been prepared. These routes are much the same as those put forward at the Imperial Conference in 1926, but it is pointed out that the actual programme for the future necessarily depends upon the results of the exhaustive series of trials which will have first to be carried out at home with the new airships.

These routes may briefly be outlined as follows—England to Canada (Ottawa) or Newfoundland; England to Cape Town, either via Cairo, Aden and east coast of Africa, or via the west coast of Africa; England to India and Ceylon via Cairo, and Karachi; and England to Australia and New Zealand, by way of India and Cocos Is. or by way of Africa.

The first demonstration services, which will follow the conclusion of the home trials, will, it is planned, be made across the Atlantic to Canada, and to South Africa—although trial flights along the India route may be possible—owing to the fact that a base in each Dominion is available. In this way, provided these first flights are successful, it will be possible to obtain some valuable and practical experience in the operation of airships under sub-arctic, temperate, sub-tropical, and tropical conditions.

Subsequently, these services having proved successful, longer and more ambitious services will be undertaken—to Australia and New Zealand. While the obvious commercial route to the Antipodes would be via India, Ceylon, and Cocos Is., it is expected that the first flights will be via Cape Town. The reason for this is because it would not be possible to fly along this route without intermediate bases for re-fuelling, and also on account of adverse winds from Ceylon. On the other hand, the other route to Australia would be better, with bases at Cairo and Cape Town, and with a favourable wind available. On the homeward journey, however, the India route becomes a more reasonable proposition, the adverse winds over the Ceylon section then being favourable.

In any case, the first demonstration flights must be arranged to follow the routes which entail the least possible expenditure on ground bases, etc., after which, should sufficient support be forthcoming from business concernes in the Dominions, the whole question of airship routes will be further developed

As we have previously stated, considerable spade work has been done by the Mission. Existing meteorological information required over the proposed routes has been added to wherever possible, and the Dominion authorities have been acquainted, in detail and by personal discussion, with the essential weather and wireless services required before airships can operate on long distance routes.

In South Africa, four possible bases were surveyed near Cape Town and four others near Durban, but the final selection has yet to be made by the South African Government—the Ministry of Transport, it may be added, is in charge of this matter. Intermediate bases were also surveyed on the west coast at Bathurst, Sierra Leone, and St. Helena, and on the East Coast at Mombasa, Zanzibar, and Dar-es-Salaam.

India is already engaged on a programme of expansion as regards commercial aviation, much having already been done especially as regards meteorological organisation for the England-India route, so it may be taken that the various requirements in connection with Empire airships will readily be met. In Ceylon, the Mission had a gratifying reception, and suitable sites for bases were selected as well as arrangements made for the provision of meteorological information.

Good work was also accomplished in Australia, Tasmania and New Zealand. Possible sites were surveyed at Perth, Freemantle, Adelaide, Melbourne and Sydney; at Burnie, Devonport, Hobart and Launceston in Tasmania; at Auckland, Christchurch, and Wellington, in New Zealand.

At the request of Mr. Bruce, the Mission supplied special information regarding Empire Airships to many of the chambers of commerce and business concerns in Australia—and in fact, were kept so busy meeting the demands for information that the stay in Australia was extended considerably over the time originally planned.

In New Zealand, also, interest was very keen, so much so that the Premier convened a joint session of the Houses of Parliament at which Group-Capt. Fellowes gave an address of some length, on the subject, numerous questions on various details being discussed and answered immediately after. Reports were presented to both the Australian and the New Zealand Governments, and each has put in hand the preliminary meteorological organisation.

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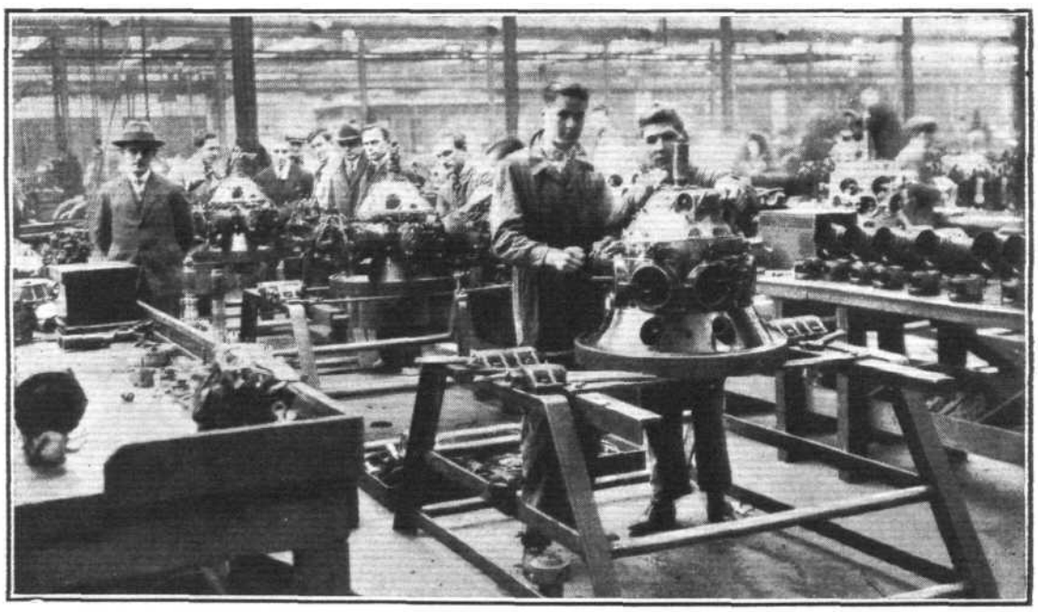


After 15,800 Miles: Officials of the Dutch Air Force inspecting, at the Armstrong Siddeley Works, the three "Lynx" engines used by Lt. Koppen on his splendid flight from Amsterdam to Batavia and back, in a Fokker monoplane.

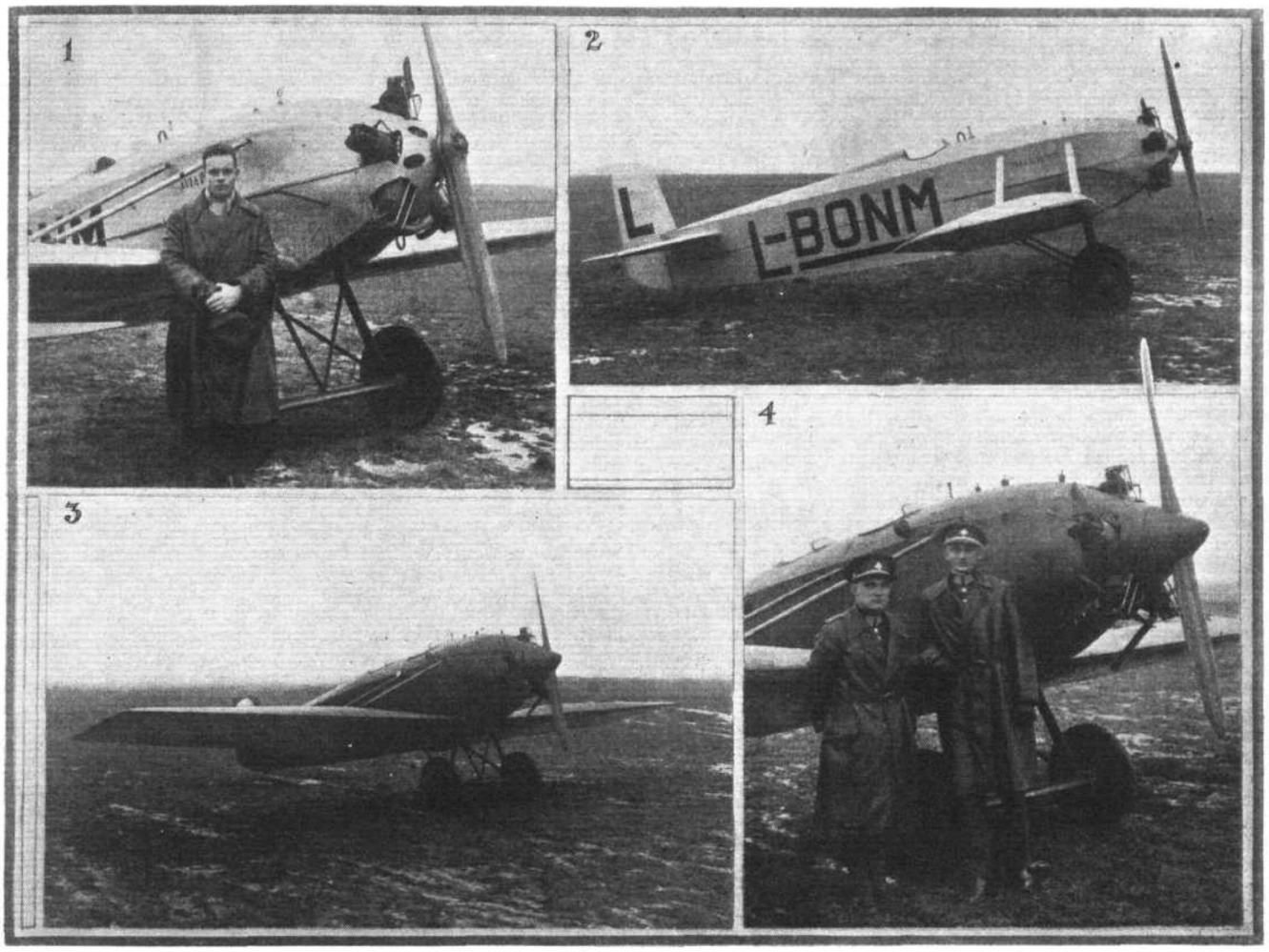
NEW LIGHT 'PLANE RECORDS BY CZECHOSLOVAKIA

FOLLOWING the attacks on light 'plane records made last October by the French pilots Finat and Knipping—both on Caudron 109 monoplanes—Czechoslovakia, on December 8 last, put up two very fine efforts to beat all previous records for distance. Czechoslovakia, it will be remembered, had already established a distance record for two-seater light 'planes over a closed circuit, when Capt. V. Vlcek and V. Charouseck accomplished a distance of 600 kms. (372·8 miles) on an Avia B.H. 9 machine at Praha, July 26, 1927.

On December 8, at 8.34 a.m., Capt. Cerny, who is chief pilot of the Skoda Works, set out from Praha with the object of beating the record for single-seater machines over a closed circuit. He was flying a single-seater Avia B.H. 11 low-wing monoplane, fitted with a boosted 60 h.p. Walter engine. The total weight of the machine was approximately 760 kgs. (1,675·8 lbs.), which included 304 kgs. (670 lbs.) of petrol and 22 kgs. (48·5 lbs.) of oil.

About the same time a second Czech pilot, Capt. Vlcek—who established the record referred to above—with Lieut. Chrastina as passenger, ascended in another Avia machine, a standard service type B.H. 9, fitted with a normal 60 h.p. Walter engine. They carried less fuel than Cerny—200 kg. (441 lbs.) of petrol and 15 kgs. (33 lbs.)—although the total weight of the machine was nearly as much.

Both machines got away well, and proceeded to fly over a closed circuit of 39·562 km. (24·5 miles) until dark. Round and round they went, improving their average speed for each lap until the gathering darkness and consequent poor visibility called for a slight slowing down.



CZECHOSLOVAKIA ATTACKS WORLD'S LIGHT PLANE RECORDS: (1) Capt. Cerny who accomplished a flight, on December 8, over a closed circuit covering a total of 1740·728 km. (1,080 miles), thus creating a record for single seaters. (2) Capt. Cerny's Avia B.H.11 single-seater monoplane, with 60 h.p. Walter engine. (3) The Avia B.H.9 two-seater (60 h.p. Walter) on which (4) Capt. Vlcek and Lieut. Chrastina also established a record, on the same day, for the two-seater class, with 1305·546 km. (809·5 miles).

Eventually, at 7 p.m., Capt. Vlcek completed his 33rd lap, and landed, having accomplished a total distance of 1,305·546 km. (809·5 miles)—thus beating the previous record for two-seaters by some 160 km. His average speed for this distance was 128 k.p.h. (79·36 m.p.h.).

Cerny continued flying for another two hours, and landed after completing his 44th lap—his distance being 1,740·728 km. (1,080 miles), and average speed 140 k.p.h. (86 m.p.h.). This also beat the previous world's record for this class.

Both machines, on landing, still had sufficient fuel left for another two hours' flying.

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The "Inflexible" goes for a Walk

THE Beardmore "Inflexible," with three Rolls-Royce "Condor" engines, the large monoplane built by Beardmores, is now at Martlesham, and last week did some taxying tests over the aerodrome. These are reported to have been entirely satisfactory. Flying tests are to be carried out as soon as weather conditions permit. As the machine has the largest span of any ever built in this country (about 160 ft.), the tests are looked forward to with considerable interest. Next week we hope to be able to record that the "Incredible," as the machine has been nicknamed, has been in the air.

Croydon

THE new air station at Croydon will now be opened on January 30, the original date, January 9, having been cancelled.

PRIVATE  FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

FLYING CLUB PROGRESS IN 1927

THE diagram which accompanies this article sets forth the performances of each active flying club in this country for the past year. It is based on the weekly reports which have appeared in our Light 'Plane columns, and has been confirmed by most of the clubs themselves. It must be understood, where critical comparison may be undertaken, that the clubs do not labour under similar conditions. The number of instructors and machines available vary.

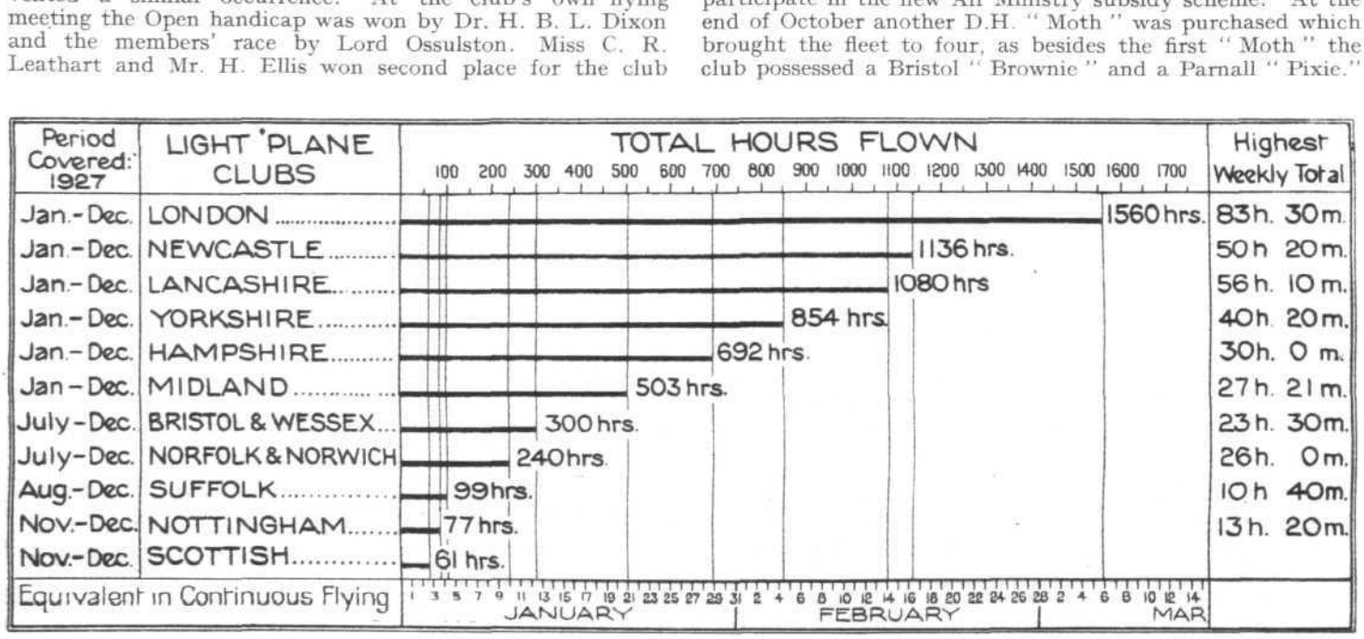
Nominally London had two instructors during the period under review, but Capt. Sparks was alone until April, when Capt. St. Barbe returned after recovering from his accident. The De Havilland School instructors sometimes gave their assistance in the evenings. The club's best daily record was 23 hrs. 35 mins. when two machines were in use, and the highest weekly total of 83 hrs. 30 mins. was established with three machines. There was only one casualty, a pupil being killed when trying for his ticket. The best time put up by soloists in one day was 13 hrs. 10 mins. A monthly record for the club was 235 hrs. 20 mins. As a unit the club has specialised in air racing with good results.

Of the Newcastle Aero Club yearly total of 1,136 hrs. the dual instruction time absorbed 393 hrs., solo training 187 hrs., and the club's "A" licence pilots did 372 hrs. Pupils launched solo numbered 28 of whom 18 obtained licences. With the exception of 20 hrs. flying on a Renault-Avro the whole of the flying was carried out on the two D.H. "Moths," and as the average number of machines in use for the period was 1·5 there is obviously much credit to be reflected on the pupils' carefulness and the efficiency of the maintenance staff. One "Moth" has averaged slightly over two hours per day since delivery in April last, and has not yet required a single replacement. It has been flown alternatively with Mk. I and Mk. II "Cirrus" engines as only one Mk. II engine is owned. The only accident to record is the crash of "LY" last February, when the pilot broke his arm. Incidentally this was the sole accident to a member since the club began flying. It was caused through engine stoppage when water got in the petrol system, and a modification since made in the system has prevented a similar occurrence. At the club's own flying meeting the Open handicap was won by Dr. H. B. L. Dixon and the members' race by Lord Ossulston. Miss C. R. Leathart and Mr. H. Ellis won second place for the club in the "Moth" utility race at the Hampshire meeting. The total membership now stands at 174.

The Hampshire Aeroplane Club made its total of 692 hrs. with two machines at the most. When engine overhauls were necessary only one was available. Sixty members are flying solo, 32 of whom have been trained *ab initio* by the instructor, Flight-Lieut. Thomson. Their youngest soloist, Mr. Hall, was only 16 years of age when he passed through his training. Another pupil, Lieut. Lambe, R.N., did his solo flight after eight lessons totalling 3 hrs. 20 mins. flying. One lady pupil, Miss Home, has made many solo flights. There is not a single accident to record which entailed the slightest injury either during the tuition period or solo flying. Finally, the social conditions have been greatly improved. There is now a fine club-house. The best monthly performance was 92 hrs.

The Midland Aero Club had no mishap during its 503 hrs. flying in 1927. Three machines were in service—two "Moths" Mk. I, and one Austin "Whippet." Incidentally the "Moths" have done 1,200 hrs. almost continuous flying, or approximately 90,000 miles since the inauguration of the light aeroplane scheme. G-EBLW has done 547 hrs. flying without overhaul beyond replacement of a few tail skids, and club membership is now 80 flying members and 150 ordinary members. Twenty pupils are under regular instruction and 16 have taken their "A" licences. The club was responsible for the organisation of the civilian events at the Birmingham Air Pageant held in July last year. The Bristol and Wessex Aeroplane Club was the first to start flying amongst the new clubs inaugurated last year.

Preliminary plans began to materialise as far back as last January, and in June a successful Air Pageant was held at Filton, followed by the purchase of a D.H. "Moth" and the commencement of flying with Mr. E. B. W. Bartlett as instructor on July 29. Three hundred hours were flown for the remainder of the year, and the membership now numbers 145, of whom 69 are associate members, and 76 pilot members. Sir Samuel Hoare presided over the official opening on October 8, when the club learned that it would participate in the new Air Ministry subsidy scheme. At the end of October another D.H. "Moth" was purchased which brought the fleet to four, as besides the first "Moth" the club possessed a Bristol "Brownie" and a Parnall "Pixie."



LIGHT 'PLANE CLUB PERFORMANCES FOR 1927: The bottom scale indicates what each club's yearly performance represents in continuous flying.

Two private owners belong to the club, one being Mr. A. H. Downes-Shaw, the chairman, and the other, Mr. C. E. Pitman. Four pupils have been trained *ab initio*, and taken their "A" licences and three old pilots have requalified.

The Norfolk and Norwich Aero Club was another of the new clubs last year, and of its total of 240 hours 90 per cent. was accomplished with one machine, a D.H. "Moth." An Avro machine assisted in the later part of the year. The best weekly performance, 26 hrs., and monthly performance, 62 hrs., were attained with only one machine. Active members total 136, Associates 33, and "A" licence holders seven, three of whom were trained *ab initio*. Six new pupils are now ready for their tests. The appointment of a ground engineer will take place shortly. One member, Mr. F. Gough, is the private owner of a D.H.53. In the autumn a "Civic Party" was held with satisfactory success, when most of the City councillors attended and made flights. The Chairman of the Club is Mr. A. A. Rice (ex-Sheriff), and the ex-Mayor of Norwich, Mr. C. R. Bignold, is on the council. These two gentlemen founded the club. Bad weather has been a very great handicap during the year. No fatalities have occurred, but there were three minor accidents, each requiring undercarriage and propeller replacements.

The Suffolk Aeroplane Club started last August. Its work for the year was done without official financial assistance. From January 1 this year, however, it has enjoyed inclusion in the new subsidy scheme. Only one machine, a Blackburn "Bluebird" was in use, and 99 hours were flown. Towards the purchase of another machine, £263 has already been subscribed. Its need is very urgent. Membership is fifty; soloists trained total four, and "A" licence pilots two. There were no fatalities. Lady Bailey is the President.

The Nottingham Aero Club had only one machine, a D.H. "Moth," in use, on which 77½ hours were flown from the opening day, November 5, until the end of the year. For the month of December 34½ hours were flown. The number of pilot members who received instruction was seventeen, soloists totalled six and "A" licence pilots one. There were no fatalities, crashes or even forced landings, and the membership has doubled and is still increasing.

On December 3 the Scottish Flying Club commenced its active existence with a meeting which drew a large crowd and brought financial satisfaction. The next day serious duties began, and for the month over 61 hours were flown. Four members received their "A" licence. The number under instruction was 40. On December 9 a dance was held, and further considerable support obtained. Social conditions have been improved, and there are interesting plans well forward for further development in this respect. It has been arranged to have another dance on February 10. Club members will have an opportunity of meeting the Executive every month to put forward their suggestions. The purchase of another machine is one of the present objectives, and a Club Badge has been designed, and will be issued shortly at a nominal charge to cover the cost. A Club Tie and Blazer are likely to follow.

AVRO "AVIAN" FOR SEAL FISHING

AN Avro "Avian," fitted with a 30-80 h.p. "Cirrus" engine, will be shipped to Newfoundland shortly for operation with the Seal Fisheries. It will replace the Avro "Baby," which is now retiring after several years of excellent service.

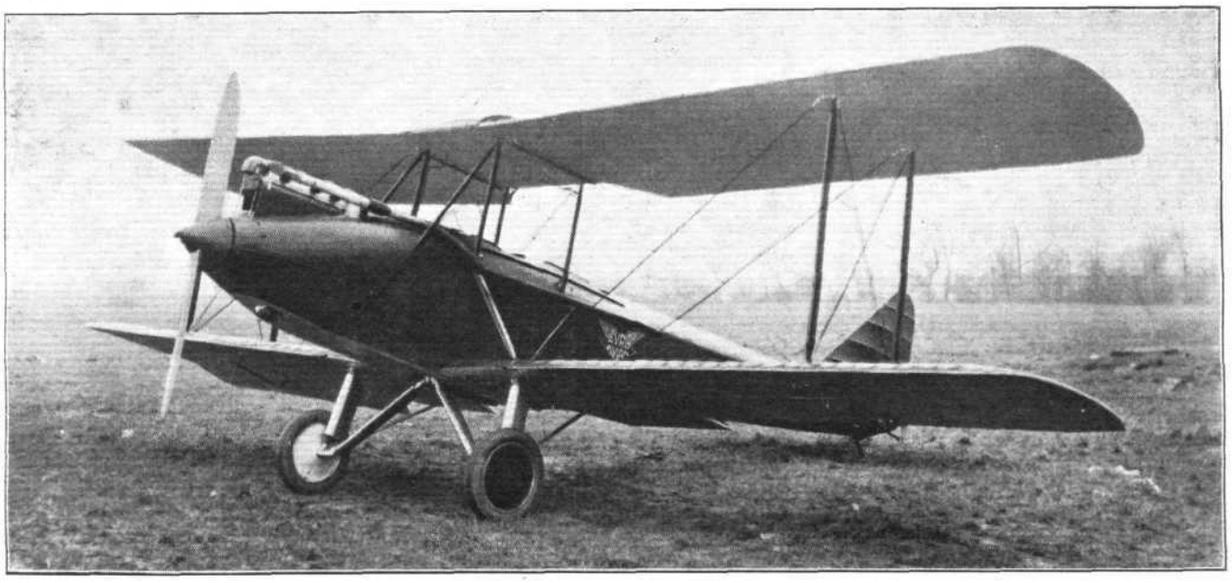
The "Baby" was specially designed for the last Antarctic expedition of Sir Ernest Shackleton, but as this was abandoned the machine was not used. It was designed hurriedly and despatched before proper tests were possible, but in spite of this it served its purpose admirably when eventually put into commission in Newfoundland. Thus the owners naturally decided to order another Avro machine when one was required.

The only alterations in this "Avian" from the standard type are the fitting of a cockpit heater operated from the exhaust pipe, and an additional petrol tank to allow a fuel capacity equal to six or eight hours' flying. The machine is painted a bright red to distinguish it against the snow.

There are only a few months in the year when seal fisheries are active, and during that time the sealing ships have to break through the ice, whilst search for the white coat seals is made from the mast-head. This process is slow and expensive, particularly as it is very difficult for a ship to return after forcing a channel through the ice, which is necessary if no seals are found in the direction taken.

The "Avian's" part will be to scout and locate the seals over a large area, and thus guide the ships to the exact spots. Even then probably many miles will have to be tramped across the ice to reach the seals. The fishermen are only concerned with the pups. On their approach the adult white back seal deserts its young. A blow on the side of the head is the killing method, and as many as 200 can be killed by a fisherman with his club in one day. A good neutral fat is obtained from the Newfoundland seals, which is subsequently used for food. The pelts are of very little value, if any.

With aeroplanes engaged in this work the first requirement is reliability, as forced descent on the broken ice far from a ship is serious, for in most cases it is impossible to get off the ice again. The "Avian" will be fitted with skis, but these conditions will still apply.



The Avro "Avian" (30-80 h.p. "Cirrus" Engine), which is to operate with the Seal Fisheries in Newfoundland in place of the Avro "Baby," the latter now retiring after several years of useful work.

LIGHT 'PLANE CLUBS

London Aeroplane Club, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.

Bristol and Wessex Aeroplane Club, Filton, Gloucester. Secretary, Lieut.-Col. C. Fleming, Filton Aerodrome, Patchway.

Hampshire Aero Club, Hamble, Southampton. Secretary, Maj. Ross White, Hamble, Southampton.

Lancashire Aero Club, Woodford, Lancs. Secretary, C. J. Wood, Oakfield, Dukinfield, near Manchester.

Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Maj. Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.

Newcastle-upon-Tyne Aero Club, Cramlington, Northumberland. Secretary, A. H. Bell, c/o The Club.

Norfolk and Norwich Aero. Club, Mousehold, Norwich. Secretary, H. O. Bennett, 5, Opie Street, Norwich.

Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria Street, Nottingham.

The Scottish Flying Club, 101, St. Vincent Street, Glasgow. Secretary, Harry W. Smith.

Suffolk Aeroplane Club, Ipswich. Secretary, Courtney N. Prentice, "Hazeldell," Stowmarket, Suffolk.

Yorkshire Aeroplane Club, Sherburn-in-Elmet, Yorks. Secretary, D. M. N. Coles, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

REPORT for week ending January 8, 1928.—There has been no flying during the week.

BRISTOL & WESSEX AEROPLANE CLUB

REPORT for fortnight ending December 31, 1927.—Total flying time, 12 hrs. Instruction, 2 hrs. 45 mins.; soloists, 4 hrs. 40 mins.; passengers, 4 hrs. 35 mins.

Instruction with Mr. E. B. W. Bartlett: Miss H. Pitman, Messrs. H. A. Tiarks, E. T. Garnett, A. E. Stephens, P. H. Bryan, A. E. Arnold, and Dr. F. J. Farr. Soloist under instruction, Mr. A. E. Roberts.

"A" Pilots: Messrs. A. H. Downes-Shaw, J. E. Tratman, R. A. Hall, and C. E. Pitman.

Passengers with Mr. Bartlett: Hon. Miss U. Bathurst, Mrs. Bowles, Mrs. Mauri, and Mr. Morris. With Mr. Tratman: Mr. Kilsby. With Mr. C. E Pitman: Miss H. Pitman, Mr. J. Pitman, Mr. P. Pitman, Mr. T. H. Clarke.

The club consider that it has established a record. Mr. C. E. Pitman left Filton for Eton and returned with his younger brother, Mr. P. Pitman, in under three hours. This is the first time that a member of a public school has returned for his holidays by aeroplane.

REPORT for week ending January 7.—Total flying hours: 2 hrs. 5 mins.; instruction, 1 hr. 5 mins.; passengers, 1 hr.

This is the worst week as regards weather conditions that the club has experienced since its formation.

Further remarks on the club's activities will be found elsewhere in this issue of FLIGHT.

HAMPSHIRE AEROPLANE CLUB

REPORT for week ending Jan. 7, 1928.—Figures for last week's work are not at present available, but further remarks on the club's past activities will be found elsewhere in this issue of FLIGHT.

LANCASHIRE AERO CLUB

REPORT for period ending January 7, 1928.—Flying time, 17 hrs. 5 mins.; instruction, 4 hrs. 35 mins.; solo flights, 9 hrs.; passenger flights, 1 hr. 50 mins.; tests, 1 hr. 40 mins.

Instruction (with Mr. Brown): Messrs. Heath, Chart, Hall, Meads, Browning, Cort, Miss Baerlein and Miss Brown. (With Mr. Cantrill): Messrs. Davison and Browning. (With Mr. Scholes): Mr. Benson.

Soloists (under instruction): Messrs. Heath, Browning, Caldecot, Ruddy, and Browning.

Pilots: Messrs. Goodfellow, Twemlow, Lacayo, Hardy, Leeming, Meads, Michelson, Nelson, Cattrell, Rowley, Crosthwaite, Miss Brown.

Passengers (with Mr. Cantrill): Miss Boyes. (With Mr. Twemlow): Messrs. Allott and Hall. (With Mr. Goodfellow): Mr. Mills. (With Mr. Leeming): Messrs. Thompson, Moffat, Benson, and Mathews.

One owes an apology, does not one, for the absence of club notes from Lancashire during the festive season. There are several explanations of an impeccable nature, all true, but as none of them would be believed, however plausible, one refrains from giving them.

Just before the Christmas holidays Lt. Heath went solo and got through his tests, all in one week, a very creditable performance. Since the New Year, however, things have been going badly. Avian QL's engine having smashed a con-rod, her sister RR's engine went on sympathetic strike, a big end bearing disintegrating for no apparent reason except pure cussedness. Thereupon Mr. Crosthwaite, on our veteran Moth MQ, lost control when taxi-ing down wind over the frost-hardened ground and dived nose first into the pond This reduced us to the Renault-Avro and even with the help of Moth V, which we have taken back from Mr. Anderson temporarily to ease the situation we are still in a bad way.

Incidentally, MQ's crash produced the first injury of any note to the personnel of the club. The pilot was quite all right but Mr. Dobson, motoring out to the crash at speed, struck a ridge on the aerodrome with the result that Colonel Nelson, who was with him, sustained a fracture of his classical nose and a generally bent face. Jolly hard lines.

No claim has been made on the B.A.I.C. under our expensive personal accident policy!

NEWCASTLE-UPON-TYNE AERO CLUB

REPORT for week ending January 1, 1928:—Total time flown, 11 hrs. 50 mins. Dual instruction, 7 hrs. 30 mins.; solo training, 1 hr.; "A" pilots, 2 hrs. 4 mins.; tests, 35 mins.

Instruction (with Mr. Parkinson): Messrs. V. Heaton, L. Heaton, L. Middleton, J. E. Griffiths, Dickinson, and Dr. Alderson. Solo (training): Mr. De Pledge.

"A" Pilots: Messrs. D. Wilson, A. Bell, Mrs. Heslop, Messrs. C. Thompson, Baxter Ellis, F. L. Turnbull.

Passengers: (with Mr. Baxter Ellis) Mr. P. L. Lawson; (with Mrs. Heslop) Mr. C. Thompson; (with Mr. C. Thompson) Mrs. Heslop, Mr. Luckman.

Week ending January 8, 1928:—Total, 8 hrs. 15 mins. Instruction 1 hr. 45 mins.; "A" pilots, 4 hrs. 50 mins.; tests, 10 mins.

Instruction: Miss O. Klyver, Messrs. L. Middleton, J. E. Fairless.

"A" Pilots: Mrs. Heslop, Messrs. Leech, Turnbull, R. N. Thompson, C. Thompson, D. Wilson.

Passengers: (with Mrs. Heslop) Mr. C. Thompson; (with Mr. C. Thompson) Mrs. Heslop, Mr. Luckman; (with Mr. F. L. Turnbull) Mr. R. N. Thompson; (with Mr. R. N. Thompson) Messrs. Turnbull and Griffiths.

NOTTINGHAM AERO CLUB

REPORT for three weeks ending December 28, 1927.—Total flying time 17 hrs. 25 mins. Dual, 11 hrs. 50 mins.; solo, 4 hrs. 55 mins.; passenger, 40 mins.

Instruction (with Mr. Martin): Messrs. Calladine, Whitby, Blake, Cox, Pilgrim, Walter, Glenn and Paul.

Solo (under instruction): Messrs. Wilcox, Hallam, Sands, Blake, Whitby and Cox.

Solo ("A" Licence): Mr. Ball.

Passenger:—With Mr. Martin: Messrs. Slocombe, Trunk and Walker. With Mr. Ball: Mr. C. Davies.

In spite of snow, rain, fog and wind, we have managed to send off three more soloists, making the total up to six, the latest additions being Cox, Whitby and Blake, the last named being, between ourselves, our first real *ab initio* £50 merchant. Blake went with the minimum of 8 hrs. dual, and put up a first-class show with a snow-covered "deck."

Mr. Cyril Sands has been appointed "Official Observer" to the Royal Aero Club, and the "A" Licence aspirants are showing themselves most anxious as to the state of his thirst.

No flying was possible Christmas week owing to rather a lot of weather and an engine-top overhaul.

May we wish all readers a very happy and prosperous New Year?

REPORT for week ending January 6, 1928:—Total flying time, 5 hrs. 50 mins. Dual, 3 hrs. 20 mins.; solo ("A" licence), 10 mins.; solo (under instruction) 2 hrs.; tests, 20 mins.

Dual (with Mr. Martin): Messrs. Wilcox, Blake, Cox, Granger, Hancock, Hallam, and Paul.

Solo ("A" licence): Mr. Paul.

Solo (under instruction): Messrs. Wilcox, Blake, Hallam, and Cox.

Bad weather has reduced our flying days to two only this week.

The top overhaul has been entirely successful; the engine is now delivering the goods up to sample.

SUFFOLK AEROPLANE CLUB

REPORT for week ending January 8, 1928.—Flying time, 4 hrs. 10 mins. Instruction (with Mr. Lowdell): Miss Edwards, R. Brown, F. Jolly.

Instruction (with Mr. Prentice): K. Peck, F. Verney, S. Schofield.

Passenger (with Mr. Prentice): Miss D. Owles.

Soloists: Dr. Jas. Sleigh, S. Schofield.

Sunday was the only day this week on which flying was possible. During the afternoon Dr. Sleigh successfully carried out his "A" licence tests in very fine style. Mr. Creasy, one of our first soloists, has now joined the Royal Air Force. It is a great disappointment to the Club that he was unable to complete his "A" licence tests before leaving.

YORKSHIRE AEROPLANE CLUB

REPORT for week ending January 7, 1928.—Flying time, 5 hrs. 30 mins. Instruction, 2 hrs. 40 mins. Soloists, 1 hr. 30 mins. Passengers, 1 hr. 55 mins.

Instruction (with Captain Beck): Messrs. Humpheries, Bell, Jackson Clayton, Miller, Ellison.

Solo Instruction: Messrs. Humpheries, Clayton.

"A" Pilots: Messrs. Thomson, Wood, Norway.

Passengers (with Captain Beck): Messrs. Ellis, Storey, Bamford. (With Mr. Wood): Mr. Critchley.

Of course, the weather this week has been beyond description, except on Tuesday, when we discarded leather coats and flying boots and basked in the sun "a la Lido."

Reg. at last! We have survived the months of damped enthusiasm and triumphed in the end. Reg. Humpheries has been dogged by the foulest of luck right through his training. If it was not bad weather, there were no machines; if the machines were all right, we were booked up; if we weren't booked up, somebody wanted "I love that girl" on the banjulele; and on these lines he has struggled through and finally won.

Another event of interest that has taken place this week is the marriage of Mr. R. H. L. Brackenbury to Miss Springman. Mr. Brackenbury has been an active member of the Club during our last season, and Miss Springman has been one of our keenest joy-riders. We wish them both the greatest joy and hope that Mr. Brackenbury's connection with the Club has not been in vain, as there is every prospect of him acquiring a Honeymoon Express in the early spring.

In South Africa

LADY HEATH and her husband, Sir James Heath, have arrived at Cape Town and been the guests for a short time of the Cape Town Flying Club. Lady Heath intends to tour the country in her new Avro "Avian." The East London Club has taken delivery of its "Moth," which was shipped out on the "City of Alexandria." The instructor will be Mr. F. Kurtz, and the charges for tuition will be £2 per hour dual control and £3 per hour solo flying. Joy-riding for the public is also included in the Club's programme.

THE CENTRAL STATES "MONOCOUPE"

An American Light 'Plane

SOME little while back the Central States Aero Co., of Davenport, Iowa, U.S.A., constructed a light monoplane, designed by Don Luscombe and Clayton Folkerts, of that firm. The performance of this first machine was so successful that the company at once put the "Monocoupe" (as it is called) into production, and the output at present is one a week.

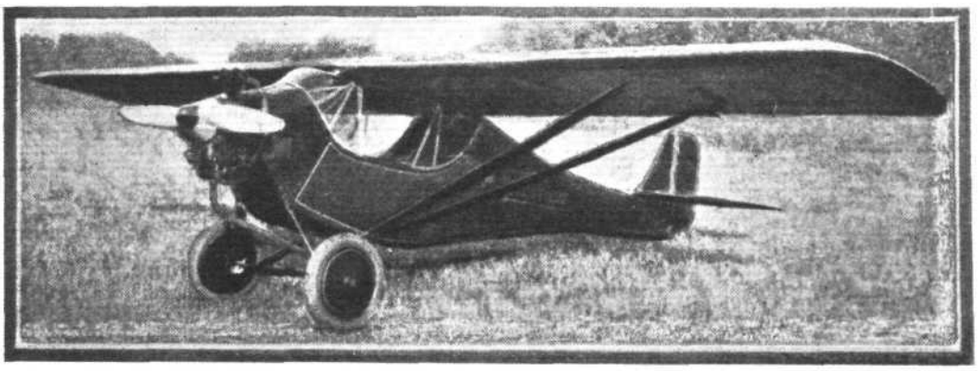
The "Monocoupe" is a high-wing monoplane—a type that has become quite fashionable now in the States—with enclosed cabin-fuselage, and fitted with a 75-h.p. Detroit "Air-Cat" 5-cyl., air-cooled, radial engine, and seating two side-by-side. It has a maximum speed of 102 m.p.h., and a stalling speed of 48 m.p.h.; the cruising speed is 80 m.p.h. with a fuel capacity of 20 gals. it has a range of about 400 miles.

Its design load factors are 6·5 for high incidence; 4·5 for low incidence; 2·5 for inverted flight; and 2 for nose-dive condition. In some places, owing to the small size of the machine, it was necessary to work with the minimum sizes, but in most main members, the strength is in excess of the required load conditions. For instance, the ribs have a margin of safety of 20 per cent.; the fore and aft wing struts are 14 per cent. and 12 per cent. respectively over required load factors, while the weakest member of the fuselage is 13 per cent. over. The weight empty of the "Monocoupe" is 650 lbs., and laden, 1,134 lbs.

The wings, which have a Clark "Y" section, are in one piece, 30 ft. span by 5 ft. chord (or an aspect ratio of six), and are externally braced from the fuselage by two pairs of steel V struts. They are of wood construction, fabric covered, the spars being of I-section selected spruce, the front spar being located at 15 per cent. of the chord, and the rear spar at 65 per cent.; the spars are spliced at the centre by a vertical cut having a slope of 1 in 12. The trailing edge is of $\frac{1}{16}$-in. piano wire.

The ribs are built up of $\frac{1}{8}$-in. basswood webs reinforced by spruce cap strips, large rectangular lightening holes being cut in the webs, and each rib, which is spaced 14 in., weighs $7\frac{1}{2}$ ozs. The compression ribs are similar, except that they have no lightening holes and are reinforced by rectangular compression members glued and nailed to each side and centering at the drag bracing fittings; the solid webs stiffen the spars against twisting.

Both front and rear bracing struts come together at the bottom of the fuselage, the cross member of the latter at this point consisting of a 1 in. by 0·049 steel tube, 32·5 in. long and having a margin of safety of 3·58 per cent. under the maximum compressive load and 4·46 per cent. under the maximum tensile load induced by the struts.

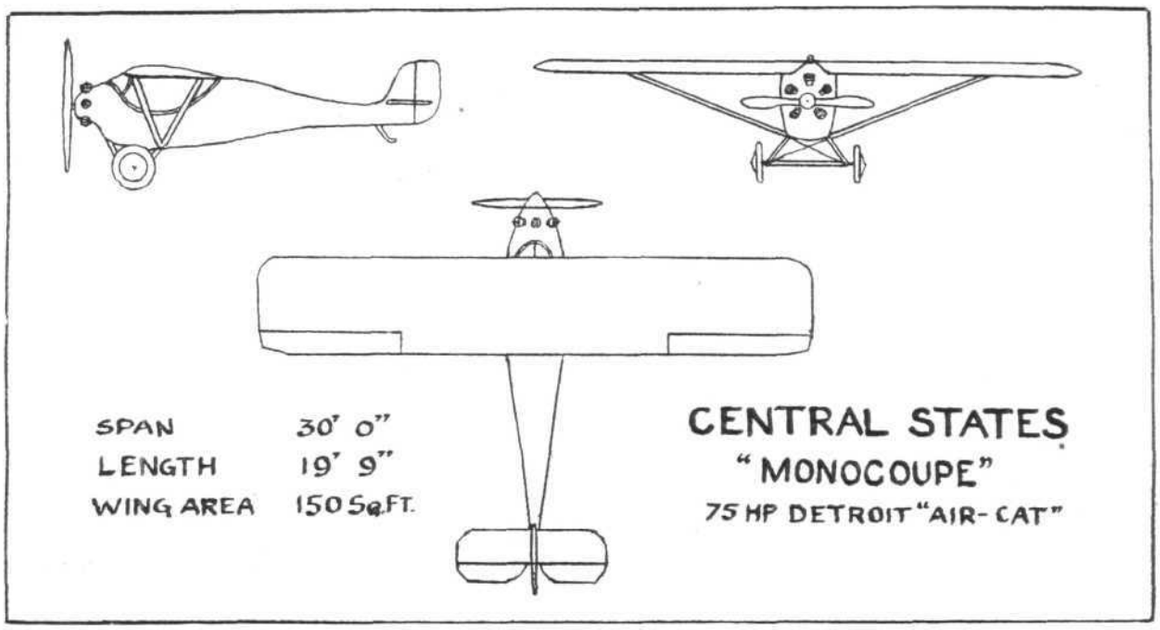


The Central States "Monocoupe": Three-quarter front view of a recent American light 'plane. It is fitted with a 75-h.p. Detroit "Air-Cut," 5-cyl., air-cooled, radial engine.

The brace-strut lower fitting is attached to the transverse tube of the fuselage by a long strip weld to insure full use of the strut strength; a central vertical "fin" prevents the fitting from bending under compressive loads. The fittings securing the struts to the spars are fastened by two $\frac{5}{16}$- and two $\frac{3}{16}$-in. nickel steel bolts, the strut bolts being $\frac{3}{8}$-in. of the same material. The single drag wire bracing is of the conventional type, No. 10 piano wire being used throughout.

The wing is attached to the fuselage by four $\frac{5}{16}$-in. nickel steel bolts passing through single lugs extending from the spars and passing through a box fitting at the upper fuselage joints.

The ailerons, of rectangular plan form, are attached directly to the rear wing spar by three pin hinges, both the spar and torque member of the aileron being reinforced at the hinge points. The ailerons are comparatively small, having an area of $12\frac{1}{2}$ per cent. of the main wing area.



The Central States "Monocoupe": General Arrangement drawings.

First-grade aeroplane fabric is employed for the wing covering stitched to the ribs at intervals of 5 in. outside the slipstream area and at 3 in. inside; six coats of nitrate dope are applied to protect the surface.

All tail surfaces are made of welded 10255 tubing, the horizontal stabilising surface being exceptionally strong; the tail is braced by 10-32 streamline wires. Rudder, elevators and ailerons are unbalanced, and the controls are of the conventional $\frac{1}{8}$-in. flexible cable-and-pulley type with stick and pedal control.

The fuselage is of welded-steel tubing built up into a Warren truss, giving ample room forward in the vicinity of the cabin, and tapering sharply in depth and width at the rear. All tubing is 20-gauge, except for an 18-gauge member, which takes the loads from the wing struts; the landing gear and rudder posts are also heavier.

The cabin—or enclosed cockpit—is very roomy, measuring 2 ft. 8 in. wide, 3 ft. 7 in. high, and 2 ft. 6 in. deep. It is upholstered with "Ca-Vel," and has "Pyralin" windows. A door is provided on either side, according to which side the throttle control is located. Normally, the main controls are situated on the left, but dual control can be fitted, if desired. Pilot and passenger sit side-by-side, the seats being slightly staggered, with the passenger's seat to the rear.

Six chrome molybdenum steel tubes welded to a ring at four points comprise the engine mount, which can be detached by removing four $\frac{5}{16}$-in. nickel steel bolts, which are under double shear.

The Detroit "Air-Cat" engine develops 75 h.p. at 2,000 r.p.m. and weighs 220 lb.; it is equipped with two Scintilla magnetos and a Stromberg carburettor. Petrol is fed by gravity from two tanks in the wings, the oil tank being located behind the engine and the oil circulated by an integral gear pump. The exhaust is led from each cylinder by $2\frac{1}{4}$-in. flexible steel tubing to a steel exhaust pipe located under the fuselage.

A conventional V-type landing gear, with straight axle and rubber shock-absorbers, is fitted, while the tail skid is of the full floating type, of 1-in. steel tube.

The principal characteristics of the "Monocoupe" are:—

Span	30 ft. 0 in.
Chord	5 ft. 0 in.
O.A. length	19 ft. 9 in.
Height	6 ft. 3 in.
Wing area	150 sq. ft.
Weight, empty	650 lb.
Weight, laden	1,134 lb.
Weight per square foot	7·58 lb.
Weight per h.p.	15·13 lb.
Speed range	48-102 m.p.h.

◈ ◈ ◈ ◈

PRATTS' "ETHYL" PETROL

DURING the last few weeks many have been puzzled by enigmatic advertisements in the general press warning all that Ethyl is coming. Ethyl is a new fuel which is now being placed on the market by the Anglo-American Oil Co., who claim that it is a fuel which eliminates what is commonly known as "engine knocking."

Its history really began about fifteen years ago, when it was found that increased compression brought a corresponding increase in "knocking." Investigation proved that, while some petrols "knocked" more than others, all "knocked" as the compression increased. Then it was discovered that the trouble could be overcome, or at any rate considerably reduced, by the addition of certain ingredients, the first of which was iodine.

But the ultimate remedy had to be commercially practicable, and this objective was attained in the discovery by Mr. Midgley, a leading American chemist, which won him the Nichols medal in 1924.

He produced what is now known as the "Ethyl Brand of Anti-knock Compound," which is a constituent part of Pratts' Ethyl petrol.

The compound is made up of tetraethyl lead, ethylene dibromide, halowax oil, and red aniline dye. The first ingredient, which is derived from alcohol and lead, dissolves in petrol in all proportions, vaporises easily and completely, and is colourless. Although it is twice as heavy as petrol, as there is only about one teaspoonful of Ethyl fluid to 1 gall. of Pratts' Ethyl petrol, the additional weight is, obviously, negligible. The addition of dibromide, it is claimed, prevents the tetraethyl lead from forming lead oxide during combustion and being deposited on sparking-plug electrodes, valve seats and valve stems, while the halowax oil is introduced because it is an extremely efficient lubricant and keeps the exhaust valve stems from becoming dry—in turn preventing sticking and burning of valves.

To give the new fuel a distinctive appearance for identification purposes, the red aniline dye is used in minute quantities.

The Anglo-American Oil Co. claims that the fuel controls the combustion rate of petrol and prevents burning too quickly in the presence of carbon and at high temperatures. The general advantages that they advance for it are smoother running, more power—particularly on hills and heavy roads—quicker acceleration, a reduction in gear changing, and the elimination of "knocking" without retarding the spark, thereby having a tendency to increase mileage and a decrease of vibration due to the absence of the "knock."

Naturally, the banishment of "knocking" means that the driver may have no warning of some troubles, so that the use of Ethyl petrol entails extra care that oil and water are plentiful.

On the question of the possible physical effect of the tetraethyl lead in this fluid on users, the producers state that an investigation over a certain period failed to reveal a single instance, but they recommend its confinement strictly to the purpose for which it is marketed, and deprecate its use for cleaning, etc. Spilling, too, should be avoided. It is also stated that the explosive tendency of the petrol is not increased.

The economical claims are the freedom from the expense of removing carbon, elimination of wear and tear caused by "knocking," and more power from each gallon of petrol. No carburettor change is necessary, the adjustment being the same as for ordinary petrol.

The price of the new fuel will be 2*d*. above that of the prevailing price of Pratts' Perfection Spirit.

Experience has already been gained of this fuel in aircraft.

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NEW WIRELESS STATION AT CROYDON AERODROME.

AMONG the developments in connection with the new London air port at Croydon—which is being officially opened on January 30—is the provision of an entirely new wireless station. This is being erected for the Air Ministry by Marconi's Wireless Telegraph Co., Ltd., to replace the one that has done duty there for the last seven years. When this station is completed in the near future Croydon will possess vastly improved aerodrome wireless equipment, which will considerably extend its range of communication with other terminal aerodromes and with aeroplanes in flight.

The new station will consist of a group of four 3-kw. wireless transmitters operated in conjunction with a wireless direction-finding receiver. The transmitters will be capable of telephonic and continuous wave and interrupted continuous-wave telegraphic transmission, the wave range being from 800 to 2,000 metres. Independent drive circuits will be incorporated to maintain constancy of frequency and wave-length. Energy for the transmitters is to be supplied by a common motor alternator group, the power from which may be switched on to any of the transmitters.

The new wireless direction-finding receiver for Croydon, specially designed for this work by the Research department of the Marconi Company, has remarkably selective characteristics and incorporates the latest filtering and amplifying devices. It is arranged so that, if required, two or more circuits can be operated on different wave-lengths for the reception of telephony and telegraphy on the same aerials.

In order to keep the neighbourhood of the aerodrome as free as possible from obstruction, the wireless masts and transmitters are being erected two or three miles from the air port and operated by the "remote control" system from the control tower at the aerodrome.

FLIGHT
AIRCRAFT ENGINEER AND AIRSHIPS

AIRISMS FROM THE FOUR WINDS

African Survey Flight Again Delayed

SIR ALAN COBHAM'S African Survey flight has once again been delayed at Malta. Repairs having been completed, successful flying tests were carried out on January 8 and 9, but on January 10 the "Singapore" broke adrift from its moorings during a strong gale and was slightly damaged. The machine will be towed to Grand Harbour, where it will be examined and repaired at the dockyard.

Australia Flight Mishap

AFTER having made excellent progress and completed over two-thirds of their journey to Australia in the Avro "Avian" biplane "Red Rose," Capt. Lancaster and Mrs. Keith Miller have met with disaster—fortunately, not very serious. Having successfully reached Singapore last week, they set out from there for Batavia on January 9, and landed at Muntok. When resuming their journey the following morning, the "Red Rose" crashed, from about 200 ft., as they were taking off. Both occupants were injured—Mrs. Miller breaking her nose, and Capt. Lancaster sustaining cuts and slight concussion—while the machine was badly damaged. Further details are at present unavailable.

Sydney-Wellington Flight Starts

THE attempt to fly from Sydney, Australia, to Wellington, New Zealand, a distance of 1,450 miles, commenced on January 10, at 2.44 a.m. (Australian time), when Capt. Knight, Capt. Hood and Lieut. Moncrieff, of the New Zealand Air Force Reserve, took off in the Ryan monoplane fitted with a Wright 220 h.p. "Whirlwind" engine. The airmen were sighted off Stephens Is., 60 miles N.W. of Wellington, at 9.50 a.m. (N.Z. time).

Barcelona-Berlin Air Link

AN air line between Barcelona and Berlin started on January 5 from the Barcelona aerodrome. General Martinez Anido, Vice-President of the Government and Minister of the Interior, Senor Aunos, Labour Minister, and the German Ambassador were present.

New Air Mail Line

ON March 1 next, the Transatlantic air mail between the Argentine and Europe will commence, operated by the Latécoère Company.

Danish Atlantic Plans

LIEUT. CLAUSON KAAS, of the Danish Royal Air Force, intends to essay a direct flight from Europe to America, starting from Copenhagen and flying via Ireland and Newfoundland.

Maiden Voyage of the "Saratoga"

THE American aircraft carrier "Saratoga," which has cost £8,000,000 to build, left Philadelphia on January 6 on her maiden voyage to the West coast to become an important unit of the Pacific fleet. The crew on board totalled 2,000, and her captain is one of the few senior officers of the U.S. Navy who is entitled to wear pilot's wings.

French Air Mission to W. Africa

ONE of the French machines carrying the French Air Mission to West Africa, arrived at Agadir on January 4 from Casablanca. On board are M. Proust and Major Gama.

Aerial Tramps

THE Far-East flight of Flying Officers Vincent and Newall in the two D.H.9 machines commenced from Stag Lane on January 9. The plotted course is through France, Italy, and Egypt. A passenger for Cairo, Mrs. Wise Parker, was on board one machine, whilst on the other, beside the pilot, were the photographer and engineer.

Variable Airscrew Tested

A VARIABLE pitch (but not reversible) airscrew, designed by D. R. Davis, of Glendale, Calif., U.S.A., was tested recently at the Glendale Airport with, it is reported, satisfactory results. It is automatically controlled by the R.P.M. of the engine and the speed of the machine, there being no control from the pilot's cockpit.

New Bellanca Factory

THE American Bellanca Aircraft Corp.—the manufacturers of the Bellanca monoplane on which Chamberlin and Levine flew from New York to Germany—is moving its factory from Arlington, Staten Is., N.Y., to New Castle, Del. The new factory will have a frontage on the Delaware River. A new machine, similar to the "Miss Columbia," is being produced (and in all probability is completed by now) by this company, which will, it is reported, be employed for a New York-Rome non-stop flight very shortly.

Aeroplanes *v.* Wolves

THE Moscow Government is attacking the increasing packs of wolves in the settled districts of Siberia with aeroplanes and bombs. The wolves are approaching the populated areas owing to the intense cold which makes it hard for them to find food. The machines fly low and shoot into the packs with light bombs.

French Air Accident

A LATÉCOÈRE flying-boat crashed at Marseilles on December 31, and the crew of five were killed. The pilot was M. Enderlin, one of the most experienced commercial pilots in France.

Col. Lindbergh's S. American Tour

COL. LINDBERGH flew from Managua, Nicaragua, to San José, Costa Rica, on January 7.

Imperial Airways' Winter Air Cruise

To meet demands from America for accommodation, Imperial Airways have decided to leave London a few weeks later than was originally intended. The new departure date is Monday, February 27, 1928. There are still a limited number of seats available for passengers from England. Additional copies of the illustrated booklet, "About the First Winter Air Cruise," will be supplied on request.

Increased Special Air Travel

CAPT. G. P. OLLEY, of Imperial Airways, has been placed in charge of the department which will operate the special charter work of the Company that has increased so much during the last few months. This pilot has been engaged solely in this sort of task for some time and it has taken him to many parts of Europe, including Spain, Portugal, Switzerland and Germany. He has now the longest service with Imperial Airways, and has been in civil aviation since September, 1919, when he joined the Handley-Page Transport Company.

Catapult Inventor Dead

MR. ROBERT FALKLAND CAREY, who invented the catapult used for launching aircraft from ships, died at Leigh-on-Sea, on January 3. His device has been adopted since the war on H.M. ships.

Airship Plans

COMMANDER C. D. BURNEY, M.P., managing director of the Airship Guarantee Company, proposed leaving for America, on January 11, to complete arrangements for the first flight of the R 100 across the Atlantic. It is also reported that the company has decided to exercise its option to take over from the Government the R.100 for operational purposes.

Man-Power Flight

CAPT. DIBOVSKY, C.M.G., former Chief of the Imperial Russian Naval Aviation Mission to the Allies, will deliver a lecture on "The Possibilities of Flying with Human Power Only," before the Society of Model Aeronautical Engineers, at the Y.M.C.A., Tottenham Court Road, tomorrow (Friday), at 7.30 p.m. Capt. Dibovsky has devoted many years of research on this subject, and is at present building a machine of this class.

Col. L'Estrange Malone Wins Northampton

COL. L'ESTRANGE Malone won the Northampton by-election for the Labour party with a majority of 557.

REVIEWS OF BOOKS

TALES OF THE AIR*

AN unknown American war pilot kept a diary during the war with the sole purpose of possessing something that would recall in the future his great experiences. Had he survived it is possible that he alone would have enjoyed the reward of his patience, for he was a modest youth, and would probably have been the last to place any value or interest in his personal record. He died, shot down by a German in aerial combat twenty miles behind the lines, and whether the world owes the publication of his diary, *War Birds*, to that fact or not, it has gained one of the most intense and vivid stories of air fighting and the hectic life of war-time London that has ever been written. Even in these days of literary candour and self-revelation its stark realism is sensational, although its truth and sincerity is undoubted, primarily because it was written to please the diarist alone and because he was a sincere youth.

When he came from America in 1917 to fight in France, he was aware he was going to live as never before and he was eager for it, and above all, anxious to justify himself in his own regard and that of his country. He looked upon this intense life that lay before him with a sort of subdued passion, and resolved to prepare himself for it by remoulding his character. Presumably his chief fault was not much more than a hasty temper which provoked a devastating swipe that instantly settled the troubles of the particular antagonist. This he determined to conquer, and when he failed, remorse inevitably followed, revealing how utterly sincere was his resolve.

Amidst his sterner qualities there were the weaknesses and vexations of youth. The voyage across the Atlantic was spoiled for him by the enforced drudgery of swotting Italian, for they were officially bound for Italy; then through one of those common results of war organisation he was kept in England, and he felt aggrieved because he had studied Italian for nothing.

He appreciates beauty, and in a brief and simple account of his first impressions of England he paints a delightful picture. It is greener than anything he has ever seen, and just like a fairy land. One of our cathedrals is the most beautiful place he can imagine, whilst Oxford, with its historical associations, is instantly fascinating.

Generosity is one of his virtues. As he passes through his training period in England and then through France he records briefly the death of each of his friends and acquaintances, invariably adding—"that was a fine fellow." He gives unstinted praise to the English, who treated him better than his own country did, but he is always fair, and makes many subtle observations about us.

Despite the shadow of death that always walked with him, he retained his sense of humour; and records some very funny incidents and stories. The story of the C.O. who suddenly ordered every pupil, no matter what their experience, to go solo because they were getting slack, is uproariously humorous. Although thirty took off as best they could and got down anyhow, not one was killed. One flattened out nicely to land—at 100 ft. He pancaked the rest and pushed the wheels through the wings. Another got off and straightaway disappeared across country. His instructor remarked that he would probably land in Scotland because he could not turn!

The latter half of the diary which concerns his air fighting experiences in France incidentally gives interesting personal glimpses of some of the great war "aces" and reveals the defects and merits of our machines. After a few months fighting his nerves became affected, and his last few notes before he was killed show his fine struggle to carry on in spite of this. He does not mind dying provided he dies decently in action. When the diary comes to an abrupt finish owing to his death the reader is left with an acute regret at the passing of such a human personality; one who was modest, humble, courageous and sensitive. He was generous to all humanity; paying many tributes to the enemy.

The second of these three books, *Nocturne Militaire*, may, in many ways, be considered as a sequel to *War Birds*. The author, Capt. Elliott White Springs, is one of the central figures in the diary, for he was, perhaps, the closest friend of the diarist, and he edited *War Birds* for publication. His own book, which comprises a number of short stories, also deals with air fighting, and to some extent it begins where the other left off. It gives, for instance, a fascinating insight into life in Paris just after the Armistice. Although the author has based these stories on his experiences as a war-pilot, he has combined fiction with facts, which makes the book less authentic as a record than the diary. Nevertheless, it creates the same atmosphere as the diary, it is as pungent and witty and bears a similarity in attractive expression and observation. This is inevitable perhaps, because both authors would influence each other's expression of common experiences because they went through them together. We learn much about Capt. Springs from the diary which, therefore, gives the reader a keener desire to read his own book. Likewise, it is reasonable to suppose that the diarist could be linked with some of the heroes in *Nocturne Militaire*. Consequently both books have an harmonious connection. *Nocturne Militaire* does actually confirm the prediction of the diarist that Springs would some day be a writer and that the artist, Clifford Knight, another war-time friend, who does the illustrations for both books, would be an artist.

The third book under review is *Perilous Days*, by Mr David Masters. Although this also narrates realistic adventures it does not grip like the other two, partly, perhaps, because they were not all personal to the author. He has made a sort of re-hash of thrilling events of modern times and given them a fresh interest by adding hitherto unknown detail. All the stories which re-tell certain historical air feats may not hold a close follower of aviation but they will certainly grip the public. Literature about the air has the tendency of history—repeating itself too much, which makes it monotonous.

**War Birds*, The Diary of an Unknown Aviator. (John Hamilton, Ltd., 15*s*. net.)

Nocturne Militaire, by Elliott White Springs. (John Hamilton, Ltd., 7*s*. 6*d*. net).

Perilous Days, by David Masters. (The Bodley Head, 8*s*. 6*d*. net.)

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Federation Aeronautique Internationale

THE Committee of the Fédération Aéronautique Internationale met on January 5 under the presidency of Comte de la Vaux. Seventeen countries were represented. The Gold Medal of the Federation was awarded to Col. Lindbergh for 1927. The Gordon Bennett Cup balloon contest was fixed for June 30, 1928, at Detroit, and the conditions of last year's race will still prevail. Concerning the Schneider Trophy Contest it was decided to make the following modification to the existing rules: "The winner to be the country which shall have gained three victories out of five successive contests, these contests to be held every two years. The next race, therefore, will be held during 1929." On the subject of the light aeroplane class for records it was decided to introduce the following weights for light aeroplanes (seaplanes):—First category.—Two-seater seaplanes: weight empty to be not more than 500 kg. Second category.—Single-seater seaplanes: weight empty to be not more than 250 kg. Third category.—Single-seater seaplanes: weight empty from above 250 kg. to 437½ kg. inclusive. The date for the conference of the F.A.I. in Brussels was fixed for June 26–29, 1928. The meeting also came to the decision not to recognise the altitude record for free balloons alleged to have been made by Capt. Hawthorne Gray, of the U.S. Army Air Corps, on November 1, when he lost his life in the attempt. M. Jacques Schneider made a special journey from Monte Carlo to attend the meeting, and congratulated Lord Thomson and the other British representatives on the British vistory of last year.

The Airship Club

THE Airship Club was represented in the Gordon Bennett Balloon Race at Detroit on September 10, 1927, by Sqdn.-Ldr. R. S. Booth and Capt. G. F. Meager, with Flight-Lieut. M. H. Steff as reserve. The chairman of the Airship Club, Mr. Griffith Brewer, and the Hon. A. F. de Moleyns were also present at the start of the race. The club was able to raise the sum of £134 towards the expenses of the British team, and the city of Detroit also contributed £166. The race for the Gordon Bennett Cup will again be held at Detroit on June 30 next, and the club appeals for donations towards the expenses of the British team. Offices: 3, Clifford Street, London, W.1.

FLIGHT

THE ROYAL AIR FORCE

London Gazette, January 3, 1928

General Duties Branch

The following airmen pilots are granted permanent commns. as Pilot Officers on probation, with effect from, and with seniority of, Dec. 30, 1927 :—157374 Sergeant L. S. Snaith, 142497 Sergeant C. S. Ellison, 330552 Sergeant R. L. Mills, 335392 Sergeant M. Lowe. The following are granted short-service commns. as Pilot Officers on probation, with effect from Dec. 13, 1927, and with seniority of Dec. 9, 1927 :—E. E. Carter, W. F. Murray, J. A. S. Outhwaite. The following are granted short-service commissions as Pilot Officers on probation, with effect from Dec. 14, 1927, and with seniority of Dec. 9, 1927 :—M. M. Freeman, G. F. Hales, C. H. R. Little, C. Stephenson. The following are granted short-service commns. as Pilot Officers on probation, with effect from Dec. 16, 1927, and with seniority of Dec. 9, 1927 :—H. R. R. Ackerley, S. O. Bufton, P. H. E. Grisewood, D. B. McGill, G. Wood.

Squadron-Leader J. H. O. Jones is seconded for duty with the British Naval Advisory Staff in Chile (Dec. 19, 1927).

Pilot Officer on probation L. S. Rollings resigns his short-service commn. (Dec. 19 1927).

Stores Branch

Flying Officer A. E. Evans, D.F.C., is granted a permanent commn. in this rank, with effect from May 21, 1927, on completion of probationary service.

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

A. G. Lamplugh is granted a commn. in Class A as a Flying Officer (Dec. 30, 1927). The following are granted commns. in Special Reserve as Pilot Officers on probation :—J. F. Bristow, J. A. Hall, W. O'B. Knox, C. E. W. N. C. Pelly (Dec. 21, 1927). The following Pilot Officers are promoted to rank of Flying Officer :—E. E. Fresson (Nov. 17, 1927) ; F. G. Wayman (Dec. 1, 1927) ; H. Bradley (Dec. 7, 1927) ; Lt. J. C. Harding (Dec. 7, 1927) ; J. H. Simpson (Dec. 14, 1927) ; R. E. Watson (Dec. 14, 1927) ; T. J. Tingley (Dec. 29, 1927).

Flying Officer H. G. Harper relinquishes his commn. on completion of service (Dec. 23, 1927) ; Flying Officer Doctor R. L. Powell relinquishes his commn. on completion of service, and is permitted to retain his rank (Sept. 12, 1927). (Substituted for *Gazette*, Nov. 22, 1927.)

AUXILIARY AIR FORCE

General Duties Branch

No. 600 CITY OF LONDON (BOMBING) SQUADRON. Flying Officer A. G. Lamplugh resigns his commission on appointment to the Reserve of Air Force (Dec. 30, 1927).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Wing Commander R. G. D. Small, to No. 1 Flying Training Sch., Netheravon, pending taking over command, 19.12.27.

Squadron Leader C. N. Lowe, M.C., D.F.C., to No. 43 Sqdn., Tangmere, 25.12.27.

Flight Lieutenant E. T. Carpenter, A.F.C, to R.A.F. Base, Gosport, 5.1.28.

Flying Officers : J. B. Wilson, to R.A.F. Training Base, Leuchars, 1.1.28. A. L. R. Duke, to Central Flying Schl., Wittering, 2.12.27. J. J. Nolan, to R.A.F. Depot, Uxbridge, 21.1.28. E. A. H. Fisher, to R.A.F. Depot, Uxbridge, 7.11.27. A. W. B. Hale, to No. 440 Flight, 13.12.27. L. L. King, to Marine Aircraft Experimental Estab., Felixstowe, 5.1.28. J. W. Vanderbeeck, to R.A.F. Depot, Uxbridge, 1.1.28. J. V. Yonge, to No. 16 Sqdn., Old Sarum, 24.1.28.

Pilot Officers : C. S. Ellison, to Central Flying Schl., Wittering, on appointment to a permanent commn., 30.12.27. M. Lowe, to No. 29 Sqdn., Duxford, on appointment to a permanent commn., 30.12.27. R. L. Mills, to Marine Aircraft Experimental Estab., Felixstowe, on appointment to a permanent commn., 30.12.27. L. S. Snaith, to No. 5 Flying Training Schl., Sealand, on appointment to a permanent commn., 30.12.27.

The undermentioned Pilot Officers are posted to the R.A.F. Depot, Uxbridge, on appointment to short service commns. (on probation), with effect from 30.12.27 :—H. Bailey, V. S. Bowling, G. C. Butler, C. W. F. Carter, N. W. Creasy, R. N. Dashwood-Tandy, W. H. B. de Courcy-Wheeler, B. G. D'Olier, E. D. Elliott, D. A. Forbes, W. R. Hartwright, J. O. C. Huggett, T. Joyce Clarke, J. B MacKenzie, K. I. F. C. Norman-Wright, N. C. Odbert, P. B. T. Rowland, B. P. Silk, J. H. T. Simpson, J. S. Tanner, W. R. Tope, R. C. Warner, W. R. C. Wilkins, and L. E. A. Wright. J. B. Fyfe, to R.A.F. Depot, Uxbridge, on appointment to a short-service commn. (on probation), 31.12.27. R. A. E. Birch, to R.A.F. Depot, Uxbridge, on appointment to a short-service commn. (on probation), 2.1.28.

Medical Branch

Squadron Leaders : R. W. Ryan, M.B., to R.A.F. Depot, Uxbridge, 3.12.27 F. E. Johnson, to R.A.F. Depot, Uxbridge, 3.12.27.

Flight Lieutenant C. V. D. Rose, to R.A.F. Depot, Uxbridge, 3.12.27.

ROYAL AIR FORCE DEVELOPMENT

New Aeroplanes and New Aerodromes

THE beginning of a new year is a convenient occasion for drawing attention to the steady, though slow, expansion of the Royal Air Force, and the substitution of new-type aeroplanes for the splendid, but now obsolescent, designs of the war era.

Overseas Commands

One notices with gratification, though with some surprise, that newly-adopted types of aircraft are being supplied to squadrons in the overseas commands, even before they are put in the possession of Home Defence squadrons. Hitherto, Iraq, the Middle East and India have had nothing except the D.H.9A and the Bristol Fighter. Of course, these are quite good machines for countries where no enemy aircraft are to be expected, but it is not good for any branch of the Royal Air Force to go on for too long with equipment which is admittedly out of date in Europe. No. 47 Bombing Squadron, at Khartum, has been the first to receive the Fairey 3 F (Lion), and No. 8 B.S. at Aden will probably soon be similarly re-equipped. In Iraq, No. 84 B.S., which is to move from Shaibah to Hinaidi, is to be re-equipped with Westland Wapitis (Jupiters).

India is also to receive some new equipment, not before it is due, probably in the form of Wapitis. The Air Force in India is to be increased by the addition of two squadrons, raising the establishment to eight squadrons, and the additions will probably both have Wapitis. It is still a matter of speculation which the two new squadrons for India will be, but some changes in the organisation in Great Britain are suggestive.

Wessex Bombing Area.

Spittlegate aerodrome is to be handed over by the Wessex Bombing Area to the Inland Area, and is to become the home of the new No. 3 Flying Training School.

The present inhabitants of Spittlegate are Nos. 39 (D.H.9A) and 100 (Horsley) Bombing Squadrons. No. 100 B.S. is to be moved to Bicester. No. 39 must go somewhere else, and this squadron seems due for re-equipment. Therefore one may hazard the guess that No. 39 B.S. will go to India with Wapitis.

Upper Heyford, near Banbury, becomes a new station of the Wessex Bombing Area. No. 99 B.S. (Hyderabads) is to move there from Bircham Newton ; while a new squadron, No. 10 B.S., will form there, and will also in all probability be equipped with Hyderabads. At present, Upper Heyford has a Station Flight, which works in connection with the Oxford University Air Squadron.

Another new squadron, No. 101 B.S., is to be formed at Eastchurch in the near future.

Fighting Area

North Weald aerodrome, near Epping, in Essex, is another new aerodrome of the Home Defence force. It has become, for the present, the home of No. 56 Fighter Squadron (Siskins), which has evacuated Biggin Hill during certain alterations to that station.

The Night-flying Flight remains at Biggin Hill, but its equipment is now Horsleys, instead of Vimys.

Special Reserve and Auxiliary Air Force

The S.R. and A.A.F. squadrons have shared in the general progress. A new S.R. squadron, No. 504 B.S., is to form at Hucknall aerodrome, with an equipment of Fawns (Lions). No. 602 (City of Glasgow) B.S. has received Fawns instead of D.H.9As. The Fawn has disappeared from the equipment of the regular R.A.F., but it is a more modern machine than the D.H.9A, and it is not a bad arrangement that the S.R. and A.A.F. should use up the surplus Fawns.

Army Co-operation and Fleet Air Arm

It is extremely gratifying to see that a new Army Co-operation squadron, No. 26, is being formed at Catterick, and is being equipped with the Atlas. Even with a fifth A.C. squadron, the army is perilously short of aircraft. No. 13 A.C. Squadron, at Andover, has been re-equipped with the Atlas.

In the Fleet Air Arm, a number of Blackburn Ripon 2 (Lion) two-seater torpedo-planes are to be given a full test. It is premature to say that this type will supplant the single-seater Dart.

F. A. DE V. R.

THE U.S. NATIONAL AIRCRAFT COLLECTION

IN view of the growing interest in aircraft, the Smithsonian Institution has recently published a handbook describing the notable collection of historical aircraft now on exhibition in the U.S. National Museum at Washington. This handbook, in itself, is of exceptional interest, for in describing the exhibits, it provides a brief resumé, with illustrations, of man's efforts to fly from the earliest known records up to modern times.

Early or primitive flight, real or legendary, such as Hermes, Itana, Icarus, Archytas, etc., are represented in this great museum in the form of a model depicting all these various attempts—a background, as it were, to the more practical modern items. Of these latter there is a model of Da Vinci's flapping-wing machine, Henson's air liner (which anticipates so many modern features), examples of Stringfellow's work, Lilienthal and Chanute gliders, and, of course, Langley's "Aerodrome."

Coming to the practical period of flying, the actual Wright biplane flown before, and bought by, the United States Government in 1908 is exhibited, together with the Curtiss biplane of about the same period.

The remaining exhibits include examples of American, Allied, and German War 'planes, and various post-war machines of historical and general interest, including the N.C.4 flying-boat which crossed the Atlantic in 1919 and the Douglas biplane "Chicago" (Capt. Lowell Smith's), which was one of the machines that flew round the world in 1924.

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The "Gloster" Journal

THE Christmas Number of the "Gloster" House Journal is, perhaps, the most interesting ever issued. Not only does it contain a number of very excellent technical articles, but the "lighter" side is also well catered for, and the Editor, Mr. Radcliffe, is to be congratulated on the contributions which he has managed to get in. We know from experience how difficult it is to get really first-class articles, and the "Gloster Mag" sets a very high standard for a house organ.

Mr. David Longden, managing director of the Gloster Co., contributes a review of the Schneider Race, while Mr. Preston writes interestingly on the development of the Schneider machines. His chief, Mr. Folland, discusses the old question, biplane or monoplane, and explains the reasons which led to the choice of a biplane for the Gloster machine. An article on steel spars by Mr. Brian L. Martin reviews the various types that have been produced, and the subjects of the variable pitch propeller in general, and the Gloster-Hele Shaw in particular, are dealt with by Mr. H. L. Milner very ably. The remaining articles are chiefly of a humorous character, and one in particular, by Rex Stocken, relating how he "captured" a prisoner during the war, is very amusing, although in relating it Stocken is rather telling a story against himself.

The magazine is very well worth reading, and we understand that a limited number of copies are available to the general public. Applications should be made to the Editor, Mr. F. Radcliffe, Gloster Aircraft Co., Ltd., Sunningend Works, Cheltenham.

Air Ministry Changes

THE new year has seen some interesting changes in the Department of Supply and Research at the Air Ministry. Maj. G. P. Pulman, O.B.E., has succeeded Lieut.-Col. F. R. Fell, D.S.O., O.B.E., as Assistant Director in charge of engines. Wing-Commander G. R. Hynes, D.S.O., from the Royal Aircraft Establishment, Farnborough, succeeds Maj. Pulman as Chief Inspector of Engines in the Deputy Directorate of Aeronautical Inspection. Col. Fell has now joined the staff of Rolls Royce, Ltd., whose Condor engines are in such great demand for large service aircraft.

New Torpedo-Carriers

THE single-seater "Dart" torpedo-carrying biplane now in general use with the Fleet Air Arm is to be superseded by the two-seater "Ripon" illustrated on page 17. Both machines are products of the Blackburn Aeroplane Company.

Royal Air Force Flying Accident

THE Air Ministry regrets to announce that as the result of an accident at Hinaidi Aerodrome to a Bristol Fighter machine of No. 6 (Army Co-operation) Squadron, Mosul, on January 9, Pilot Officer Lionel Edward Ruggles Fisher, M.C., Royal Air Force, the pilot of the aircraft, was killed, and Lieutenant Sidney Gordon Haserick, King's Own Yorkshire Light Infantry (attached Iraq Levies), was dangerously injured, and died of injuries on the same day.

PERSONALS

Married

FLIGHT-LIEUT. B. H. C. RUSSELL, R.A.F., was married on December 22 1927, at the Cathedral, Bombay, to ELIZABETH MARY, youngest daughter of the Rev. H. N. and Mrs. KINGDON, Springfield, Stockbridge, Hants.

To be Married

A marriage has been arranged, and will take place in London in February, between FLIGHT-LIEUT. E. P. M. DAVIS, A.F.C., A.M., and FREDERIKA (FREDA), daughter of his EXCELLENCY JONKHEER A. VAN DER GOES, Netherland Minister in Rome, and Mme. van der Goes.

An engagement is announced, and the marriage will take place very quietly at the end of January, between FLIGHT-LIEUT. W. W. DEANE, R.A.F., and FLORA DOUGLAS, second daughter of Major and Mrs. J. W. SMITH, Weyhill.

The engagement is announced between FLIGHT-LIEUT. J. OSBORN GROVES, eldest son of Colonel and Mrs. Groves, of Dean's Green Hall, Lymm, Cheshire, and ELIZABETH MARY, younger daughter of the late MR. and MRS. H. C. HUMPHERY, of Beaulieu, Hants.

⁂ ⁂ ⁂ ⁂

NEW COMPANY REGISTERED

SAFETEX SAFETY GLASS, LTD.—Capital, £325,000, in 275,000 preferred ordinary shares of £1 each and 1,000,000 deferred shares of 1s. each. Manufacturers of and dealers in reinforced and non-splinterable glass. Secretary: C. L. Croft. Solicitors: Soames, Edwards and Jones, Lennox House, Norfolk Street, Strand, W.C.

⁂ ⁂ ⁂ ⁂

PUBLICATIONS RECEIVED

Calendar, 1928. The Bristol Aeroplane Co., Ltd., Filton, Bristol.

Calendar, 1928. British Airships, Ltd., 21, Northumberland Avenue, London, W.C.2.

The "Gloster IV," Schneider Trophy Race, 1927. From the Painting by Geoffrey Watson. The Gloster Aircraft Co., Ltd., Cheltenham.

Catalogue

British Industries Fair, February 20-*March* 2, 1928. *Special Overseas Advance Edition.* Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1.

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AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

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